Input Indicators of the British Columbia High Technology Sector: 2013 Edition

PREPARED FOR THE MINISTRY OF TECHNOLOGY, INNOVATION AND CITIZENS' SERVICES
BY BC STATS – OCTOBER 2013

BRITISH COLUMBIA | BCStats

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1. Executive Summary

The 2013 edition of the *Input Indicators of the British Columbia High Technology Sector* report is prepared by BC Stats, and is the tenth in a series of reports that began with the edition produced in 2000. This series of reports highlights some conditions affecting British Columbia's high technology sector from a supply-side perspective. This year, the report tracks the evolution of 41 business and economic climate indicators necessary for the development of the high technology sector in B.C. and provides comparisons to other provinces and Canada as a whole. The indicators cover key aspects of the educational, business, government, external, and labour sectors from the point of view of their impact on high technology businesses.

This edition has expanded the scope of measurement in the education and labour sectors. This new section is comprised of indicators relating to the experience and labour outcomes of students graduating from high tech disciplines in British Columbia's public post-secondary institutions. A total of 14 new indicators were added from the BC Student Outcomes survey data. There are also new supporting tables in the Appendix, which add further detail to indicators in this section.

The indicators in this report, which can be termed "input" measures, are chosen for their relevance and general acceptance, as well as their availability on an ongoing basis. All indicators have been updated to the latest year for which data were available as of August 2013.[1]

Indicators of the success, or "outputs" of the high technology sector, are covered by a companion report, the Profile of the British Columbia High Technology Sector. The Profile contains information on high technology GDP, employment, wages and salaries, revenues, establishment counts and exports and imports.

The picture of British Columbia that emerges from the most recent input indicators is varied. In many areas, British Columbia compares quite favourably with other provinces, and has shown notable growth. On the other hand, performance has lagged in other areas. As such, the detailed indicators have great potential for offering tangible direction for government policies and industry growth strategies.

The indicators covered in this report span available data for the most recent reporting years and, in many cases, date back at least a decade. Where available, data are included

[1] Some of the data come from reports, studies, and/or surveys that are only released bi-annually and, in other cases, less frequently. Every effort has been made to use the most recent data possible.

for other provinces, particularly for those supporting the bulk of Canada's high technology sector: Alberta, Manitoba, Ontario and Quebec. Along with B.C., these provinces are referred to throughout the text as the "high technology provinces."

Regional data for British Columbia have not been incorporated into the report, due mostly to data restrictions and gaps in information. Similarly, international statistics have not been included, mainly because of the difficulty of making valid comparisons of indicators collected with varying definitions and against very different backdrops of social and economic organization.

1.1. Highlights

1.1.1. Education Sector

British Columbia shows evidence of strong educational attainment in the general population. Indeed, the data for the last reporting year show that, compared to the other Canadian provinces, B.C. continues to have the highest percentage of the population with high school education, a rank it has held for at least the past decade. However, there appears to be a deficiency with respect to the training of new graduates in some academic fields relevant to high technology. In architecture, engineering and related technology, for example, graduates in relation to population remain well below the Canadian average. Similarly, higher education research and development as a share of GDP is low by Canadian standards. However, B.C.'s universities have made great strides in terms of technology licenses and patents issued. The University of British Columbia (UBC) continues to lead all other Canadian U-15 (top 15 research institutes) universities in terms of gross income from technology licences. UBC has also been a solid leader in the number of U.S. patents it has been awarded. The province also fares relatively well in terms of funding for researchers in its educational institutions.

1.1.2. Business Sector

Compared to other Canadian provinces, British Columbia returns average or below average ratings in approximately half of the business stimulus indicators. However, some have long term upward trends and have demonstrated solid performance in recent years. In 2010, the ratio of research and development (R&D) performance by business to provincial GDP remained at about half that of Quebec, but B.C. still held a solid ranking of third among the provinces. British Columbia also scores below average on

some other business stimulus indicators, such as patents awarded per capita, but showed considerable strength in growth in the number of high technology businesses in 2012. Also, per capita venture capital investment in B.C. exceeds the national average.

1.1.3. Government Sector

Taxation of individuals, small businesses and corporations is more favourable in B.C. than in most other provinces. All three levels of tax rates in the province shrank over the last decade, and in 2013, remain among the lowest in the country. Combined federal and provincial government performance of R&D (as a share of GDP) is lower in B.C. than in all other provinces. However, the province fares much better in terms of gross expenditure on R&D as a share of GDP, ranking third in the country.

1.1.4. External Sector

Canada, and with it B.C., benefits from a large number of well-trained and well-educated immigrants. In relation to its population size, British Columbia is on par with other provinces in attracting skilled foreigners, although their average level of education tends to be slightly lower than in some other provinces of destination. After having experienced a net outflow of people from B.C. to other parts of Canada between 1998 and 2003, the province saw an increase of in-migration from other provinces over much of the next decade, which bolstered the province's supply of well-trained, educated workers. In 2012, however, B.C. saw a net outflow of people to other provinces for the first time since 2003.

B.C. imports of high technology goods—which can be an indicator of future production since imported components are often used to produce high tech products—increased for the third straight year in 2012.

1.1.5. Labour

Unemployment rates among workers in the natural and applied sciences tend to be substantially lower than rates for the economy overall. Despite creeping up in 2009 in the face of the economic downturn, rates slid down over the next few reporting years and remain significantly lower than for the economy as a whole. In terms of researchers per 100,000 population, British Columbia maintained its third-place standing in 2010. B.C.'s largest city remains among the most desirable places to live in the world, ranking first in the Americas for quality of life, despite its somewhat high cost of living.

1.1.6. Post-Secondary Outcomes

Results from the BC Student Outcomes surveys indicate that graduates from high technology-related disciplines are generally satisfied with their education and found their studies useful in the workplace. Of those graduates that were employed at the time of the survey, the majority were working in high technology occupations and found that their educational training was relevant to their position. Most were paid workers (as opposed to self-employed) and worked full-time. On average, graduates working in high technology occupations earned more than their counterparts working in non-high tech fields.

1.2. Indicator Summaries

An ongoing feature of this publication is the simple description of the trends in each indicator as up, down or stable (indicated in summary tables as: ↑,↓ or →). The assessment is made with regard to the trend over the span of time for which the data are available and for the latest period.[2] Also included is a comparison ranking B.C. with the high tech provinces for each indicator as well as an overall ranking. Since the last edition (2010), the trend in some indicators has been re-evaluated, based on the latest information. Table 1 provides a quick summary of trends and rankings for each indicator. Summary results for each sector are presented at the start of each section in the body of the report. More detailed statistical information is contained in the tables in the Appendix.

[2] Note that the fact an indicator may be rising in relation to other provinces does not necessarily indicate an advantage for British Columbia. For example, above average taxes would normally be viewed as a negative indicator from the point of view of the high technology sector. For this purpose, the summary arrows are colour-coded to indicate positive (green), neutral (yellow) or negative (red) trends.

TABLE 1: QUICK SUMMARY OF INDICATORS

INDICATORS	Trend		Ranking	
	Long-Term	Latest Year	Five High Tech Provs.	Overall
EDUCATION SECTOR				
E-1: Percentage of population with a high school diploma	↑		1 of 5	1 of 10
E-2: Percentage of pop. with post-secondary credentials	↑	→	3 of 5	4 of 10
E-3: 13 year-old student achievement in science	n/a	↑	3 of 5	3 of 10
13 year-old student achievement in math	n/a	↓	4 of 5	4 of 10
E-4: Total bachelor degrees awarded per 100,000	↑	↑	3 of 5	6 of 10
E-5: Total graduate degrees awarded per 100,000	↑	↑	3 of 5	4 of 10
E-6: Bachelor degrees awarded in engineering*	↑	↑	4 of 5	8 of 10
E-7: Bachelor degrees awarded in computer science*	↓	↓	2 of 5	3 of 10
E-8: Bachelor degrees awarded in physical & life science*			3 of 5	6 of 10
E-9: Percentage of households with computers	↑	↑	2 of 5	2 of 10
E-10: Percentage of households using the Internet	↑	↑	2 of 5	2 of 10
E-11: Income from technology licenses at U-15 universities†	→	↑	1 of 5	1 of 15
E-12: U.S. patents issued to U-15 universities‡	↓	↓	3 of 5	3 of 7
E-13: University start-up companies formed‡	→	↑	2 of 5	2 of 7
E-14: Higher education performance of R&D (HERD) to GDP	↑	↑	4 of 5	6 of 10
E-15: Per capita grants and awards funded by CIHR	n/a	n/a	3 of 5	3 of 10
E-16: Per capita projects funded by CFI: Health	n/a	n/a	3 of 5	3 of 10
Per capita projects funded by CFI: Nat. Sci. & Eng.	n/a	n/a	3 of 5	6 of 10
E-17: NSERC grant & scholarship expenditures	↑	↑	2 of 5	4 of 10
E-18: Canada Research Chairs	n/a	n/a	2 of 5	3 of 10
BUSINESS SECTOR				
B-1: Patents per 100,000 persons		↑	4 of 5	5 of 10
B-2: Patents granted as a % of applications, 3 year average	↑	↑	5 of 5	6 of 10
B-3: Entries to the high tech sector		↑	n/a	n/a
B-4: Exits from the high tech sector	↑	↑	n/a	n/a
B-5: High growth high tech companies		↓	n/a	n/a
B-6: Venture capital investment, total#	→	↑	3 of 5	3 of 7
B-7: Venture capital investment: share of Canadian total#		↓	3 of 5	3 of 7
B-8: Business expenditure on R&D (BERD) to GDP		↓	3 of 5	3 of 10
GOVERNMENT SECTOR				
G-1: Personal tax index individual with $80,000 income	↓	↓	1 of 5	1 of 10
G-2: Small business tax rate	→	→	2 of 5	4 of 10
G-3: Corporate income tax rate	↓		1 of 5 (tied)	1 of 10 (tied)
G-4: Government expenditure on R&D (GOVERD) to GDP	↓	↓	5 of 5	10 of 10
G-5: Gross expenditure on R&D (GERD) to GDP		↓	3 of 5	3 of 10
EXTERNAL SECTOR				
X-1: Percentage of immigrants with 16+ years of education		↓	3 of 5	5 of 10
X-2: Median years of schooling of immigrants	↓	↓	3 of 5	5 of 10
X-3: Net inter-provincial migration	↓	↓	3 of 5	8 of 10
X-4: High technology imports	↑	↑	n/a	n/a

LABOUR				
L-1: Unemployment rate for natural and applied sciences		↑	5 of 5	6 of 10
L-2: Research personnel per 100,000 population	↑	↓	3 of 5	3 of 10
L-3: Quality of life, Vancouver∞	↓		n/a	5 of 221
L-4: Cost of living×	→	↑	n/a	5 of 6

* The tables for these indicators are split into part (a) for Bachelor degrees and part (b) for Graduate degrees. Data for degree area of engineering include architecture, engineering and related technologies; data for degree area of computer science include mathematics, computer and information sciences. Ranking is measured on a per capita (per 100,000 persons) basis.
† The ranking compares UBC to all U-15 universities.
‡ These indicators are a sum of the U-15 universities. The ranking is out of 7 because only seven provinces have U-15 universities.
# The overall ranking is out of 7 because the Atlantic Provinces are grouped together as one.
∞ The ranking compares Vancouver to 221 cities worldwide.
× The ranking compares Vancouver to five other Canadian cities.

INDICATORS	DACSO Graduates		BGS Graduates	
	High Tech Program	Non-High Tech Program	High Tech Program	Non-High Tech Program
O-1: Satisfaction with education	92%	94%	92%	94%
O-2: Quality of instruction~	94%	95%	92%	95%
O-3: Further studies since graduation	32%	36%	58%	54%
O-4: Current activity:				
Studying	11%	9%	27%	11%
Studying and working	15%	19%	18%	22%
Working	65%	60%	49%	61%
Neither studying nor working	9%	11%	7%	7%
O-5: In the labour force	89%	90%	79%	91%
O-6: Employment rates	80%	80%	70%	84%
O-7: Unemployment rates	9%	10%	11%	6%
O-8: Job related to training^	81%	74%	70%	73%
O-9: Knowledge, skills & abilities useful in job^	85%	82%	80%	85%
	DACSO Graduates		BGS Graduates	
	Employed in High Tech Occupations	Not Employed in High Tech Occupations	Employed in High Tech Occupations	Not Employed in High Tech Occupations
O-11: Training related to job^	92%	75%	86%	72%
O-12: Paid worker^!	95%	95%	95%	95%
O-13: Full-time employment^	84%	74%	95%	82%
O-14: Median income (hourly for DACSO, annual for BGS)	$24	$19	$55,000	$44,000

~ On the DACSO Survey, quality of instruction was asked using a 5 point scale: very good, good, adequate, poor, and very poor. Percentages presented for DACSO quality of instruction include very good, good, and adequate. On the BGS Survey, quality of instruction was asked using a 4 point scale: very good, good, poor, and very poor. Percentages presented for BGS quality of instruction include very good and good.
^ Of those respondents who indicated they were employed.
! In the DACSO Survey, respondents were asked if they were paid workers or self-employed. In the BGS Survey, respondents were asked if they were paid workers, self-employed, or both a paid worker and self-employed. Percentages presented for the BGS Survey represent the percentage of respondents who indicated they were solely a paid worker and those who indicated they were both a paid worker and self-employed.
Note that data from the DACSO and BGS surveys are for British Columbia only and, therefore, provincial comparisons are not available. Due to small numbers, three years of data had to be combined in order to be able to have reportable figures. As a result, time series comparisons are not possible either. Indicator O-10 is not amenable to a quick summary presentation and, therefore, is excluded here.

2. Introduction

Over much of the last century and particularly over the past 25 years, information has grown dramatically in importance as a driver of economic growth. Although industry has been knowledge- and technology-based throughout history, global and local economies alike have become far more dependent on the production, dissemination and use of knowledge. In turn, output and employment have expanded rapidly in high technology industries, which rely heavily on knowledge as a primary input. As such, these industries are obvious starting points for measuring the impact of new knowledge-based technologies on economies.

2.1. Background

In 2000, the first edition of *British Columbia High Technology Input Indicators: The 1990s* was released. The purpose of the report was to monitor the high technology sector from the input side, by measuring and analyzing the production and application of knowledge, and the climate, institutions and funding arrangements that make this knowledge available for the development of the provincial high technology sector. The report has been updated regularly since then, this being the tenth edition.

A companion report, *Profile of the British Columbia High Technology Sector*,[3] has been produced regularly since 1994. The profile focuses on measures of Gross Domestic Product (GDP), employment, wages and salaries, revenues, establishments, and exports and imports. Such measures could be referred to as the outputs of the high technology sector and aim to give a broader overview of where B.C.'s high technology sector has been and where it might be heading.

While there is obvious value in monitoring the "output" of the high technology sector, information about the processes that give rise to that output are also of key importance, both for potential investors interested in the infrastructure available in the province and for policy-makers who require this data to make informed policy decisions. In fact, the high technology sector and the surrounding infrastructure are a complex system with many players and interactions. Understanding this system is a matter of identifying the various parts and collecting information that shows how these parts behave and interact over time. For a more detailed description of the high technology "system," see

[3] Available at www.bcstats.gov.bc.ca

Appendix I. A list of industries that are included in the high tech sector is available in Appendix II.

Information on the high technology system can help show the best ways to promote growth in the sector. This may include assistance to parts of the system that are only indirectly linked to actual production. For example, improvements to the secondary school system may seem very different from output subsidies or tax cuts for high technology firms, but both may have the effect of promoting growth in the high technology sector in the long term. Good information provides policy makers with the tools to assess the current situation, as well as an indication of where more effort may be needed to provide an environment in which high technology and other knowledge-based industries can thrive.

2.2. Comparison with Other Jurisdictions

Wherever possible, the indicators selected for this publication use comparisons to other provinces and show the range of what is possible, or what has been achieved, in the high technology sector within a Canadian context. The publication focuses on trends in British Columbia as they compare to those in Alberta, Manitoba, Ontario and Quebec. These five provinces have the largest populations, economies and the most extensive high technology sectors in the country. They are referred to as the "high technology provinces" in this report.

2.3. The "Quick Summary" Tables

The indicators selected for this publication represent only a fraction of the information base that is available for the high technology sector. However, even this number of indicators measured over time and across provinces poses a challenge to readers looking for an overview of the current situation and an indication of which areas warrant further study. To meet this challenge, this report is first divided according to the four "sectors" outlined in the model diagram (see Appendix I). One of the "inputs," labour, is also covered in a separate section. Each of the five resulting sections covers a number of individual indicators. These indicators are listed on the first page of each section, providing a quick summary.

The summary makes use of up, down and horizontal arrows (↑,↓,→) to show whether the indicator has risen, dropped or remained relatively stable. The assessment is made

with regard to the trend over the span of time for which the indicator is available and for the latest period. The summary arrows are colour-coded to indicate positive (green), neutral (yellow) or negative (red) trends. Wherever possible, British Columbia is also ranked against other provinces for each indicator.

Since the arrow indicators show only the direction of change, the summary report gives no indication of the size of changes or their detailed pattern over time. This information is found in the graphs and text included in each section. More comprehensive data tables for each indicator are located in Appendix III.

Some indicators are not available as a time series; however, they provide information that better reveals the big picture with regard to the condition of high technology in British Columbia and in other parts of the country. Although included in the Quick Summary tables for reference purposes, these indicators do not have corresponding arrow symbols, but are instead marked with 'n/a', where comparisons over time or to other regions are not possible.

3. Educational Indicators

The educational sector provides inputs to high technology firms in three ways:

1. When individuals acquire skills and knowledge required for product development and production,

2. During the commercialization of research performed in the educational sector, and

3. Funding and performance in research and development.

The indicators listed below are measures of these roles. Many are presented on a per capita basis (expressed as rates per 100,000 population where per capita figures are quite small), as regional shares of national totals, or as a share of gross domestic product (GDP) to allow meaningful comparison with other provinces.

TABLE 2: QUICK SUMMARY OF INDICATORS FOR THE EDUCATION SECTOR

INDICATORS	Trend		Ranking	
	Long-Term	Latest Year	Five High Tech Provs.	Overall
E-1: Percentage of population with a high school diploma	↑	→	1 of 5	1 of 10
E-2: Percentage of pop. with post-secondary credentials	↑		3 of 5	4 of 10
E-3: 13 year-old student achievement in science	n/a	↑	3 of 5	3 of 10
13 year-old student achievement in math	n/a	↓	4 of 5	4 of 10
E-4: Total bachelor degrees awarded per 100,000	↑	↑	3 of 5	6 of 10
E-5: Total graduate degrees awarded per 100,000	↑	↑	3 of 5	4 of 10
E-6: Bachelor degrees awarded in engineering*	↑	↑	4 of 5	8 of 10
E-7: Bachelor degrees awarded in computer science*	↓	↓	2 of 5	3 of 10
E-8: Bachelor degrees awarded in physical & life science*	→	→	3 of 5	6 of 10
E-9: Percentage of households with computers	↑	↑	2 of 5	2 of 10
E-10: Percentage of households using the Internet	↑	↑	2 of 5	2 of 10
E-11: Income from technology licenses at U-15 universities†		↑	1 of 5	1 of 15
E-12: U.S. patents issued to U-15 universities‡	↓	↓	3 of 5	3 of 7
E-13: University start-up companies formed‡		↑	2 of 5	2 of 7
E-14: Higher education performance of R&D (HERD) to GDP	↑	↑	4 of 5	6 of 10
E-15: Per capita grants and awards funded by CIHR	n/a	n/a	3 of 5	3 of 10
E-16: Per capita projects funded by CFI: Health	n/a	n/a	3 of 5	3 of 10
Per capita projects funded by CFI: Nat. Sci. & Eng.	n/a	n/a	3 of 5	6 of 10
E-17: NSERC grant & scholarship expenditures	↑	↑	2 of 5	4 of 10
E-18: Canada Research Chairs	n/a	n/a	2 of 5	3 of 10

* The tables for these indicators are split into part (a) for Bachelor degrees and part (b) for Graduate degrees. Data for degree area of engineering include architecture, engineering and related technologies; data for degree area of computer science include mathematics, computer and information sciences.
† The ranking compares UBC to all U-15 universities.
‡ These indicators are a sum of the U-15 universities. The ranking is out of 7 because only seven provinces have U-15 universities.

British Columbia exhibits mixed results among educational indicators. The province has historically had strong educational attainment in the general population and data for the most recent reporting year shows that B.C. continues to have the highest percentage nation-wide of its population with a high school education. Despite the high proportion of high school graduates, the province lags other parts of the country in the post-secondary training in general and specifically among new graduates in science and technology-related disciplines. B.C.'s ratio of higher education R&D to GDP is also somewhat low when compared to the nation as a whole. Overall, in terms of providing a hospitable landscape for innovation in scientific research, B.C. presents itself favourably.

3.1. Educational Attainment

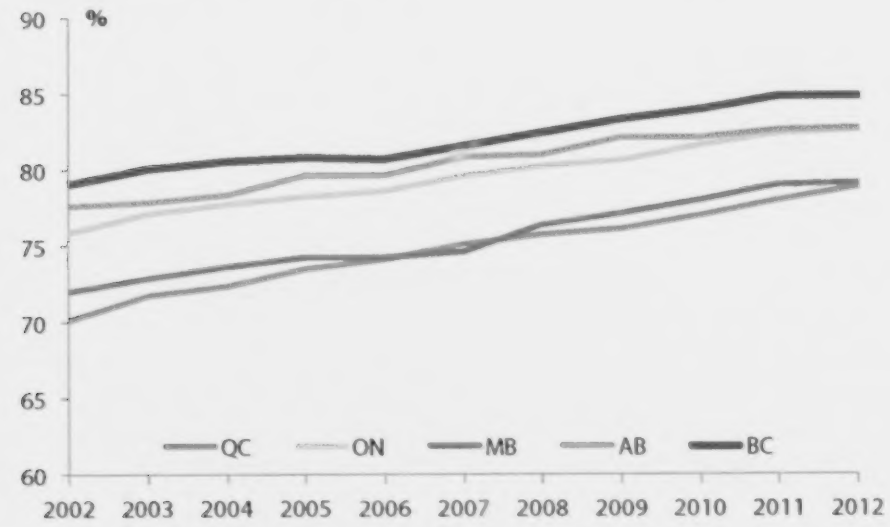
The indicators understood:

Higher levels of educational attainment enable high technology firms to draw from a broader, more highly-developed skill base. Higher levels of educational attainment also suggest a more knowledgeable population that is better able to understand and participate in the complexity of the high technology economy.

Similarly to the rest of Canada, the overall trend for B.C. continues to indicate that more and more British Columbians are completing high school and continuing their education to obtain post-secondary credentials. Four indicators of educational attainment—the percentage of the population aged 15 and older with a high school diploma, the percentage with post-secondary credentials, and the ratio of bachelor and graduate degrees awarded in the provinces—have all shown steady increases across Canada over the past decade.

At 85% in 2012, B.C. led the country with the highest percentage of its population having a high school diploma. The province has recorded the highest percentage since at least 1990, when 72% of its population aged 15 and over had graduated from high school, compared to the national average of 64%. However, the gap between B.C. and the other high technology provinces has gradually narrowed over the past decades, such that by 2012, the share of B.C.'s population with a high school diploma was only three percentage points higher than the Canadian average (82%).

INDICATOR E-1: PERCENTAGE OF THE POPULATION 15 YEARS AND OLDER WITH A HIGH SCHOOL DIPLOMA

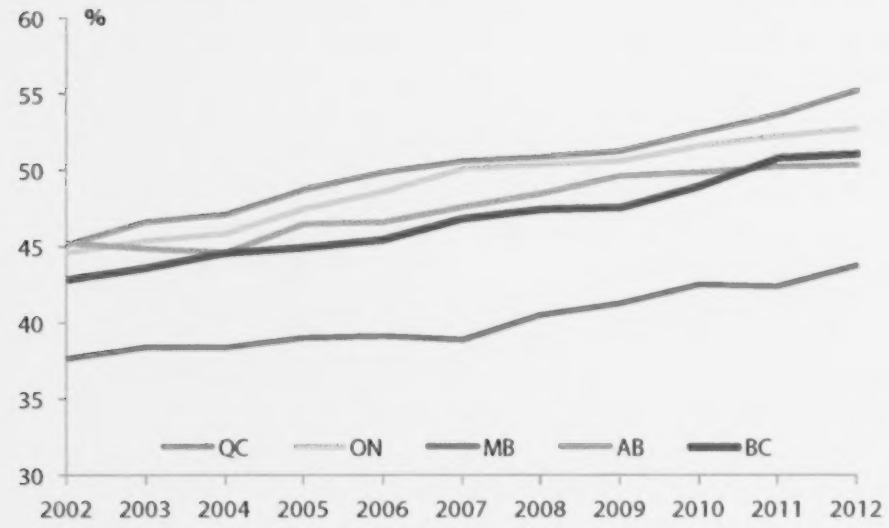


B.C. consistently leads the country in share of population with a high school diploma

Data source: Statistics Canada

British Columbia has improved its post-secondary achievement over the past decade at a more rapid pace than most other provinces. In 2012, approximately 51% of the province's population had post secondary credentials, an increase of around eight percentage points over 2002 (43%). Over the same decade, only Quebec (10 points) and Newfoundland and Labrador (10 points) saw higher growth. Among the five high technology provinces, the gaps in proportion of the population with post-secondary credentials remain relatively small, but have widened slightly in the period observed. Until the early 2000s, Alberta consistently had the most post-secondary degrees per capita, followed closely by B.C. However, over the past several years, Quebec and Ontario have surpassed the Western provinces.

INDICATOR E-2: PERCENTAGE OF THE POPULATION 15 YEARS AND OLDER WITH POST-SECONDARY CREDENTIALS



Data source: Statistics Canada

The percentage of B.C.'s population with post-secondary credentials continues to rise and now exceeds Alberta

3.2. Achievement on Canadian Standardized Tests

The indicator understood:

Standardized testing offers a comparable nation-wide measure for the demonstrated skills and knowledge of students of a given age. School programs differ from one part of the country to another, so making comparisons of results from these various programs is a complex task. However, young Canadians in different provinces and territories learn many similar skills in mathematics and science.[4]

[4] The School Achievement Indicators Program (SAIP) was a cyclical program of pan-Canadian assessments of student achievement in mathematics, reading and writing, and science that was conducted by the Council of Ministers of Education, Canada (CMEC) between 1993 and 2004. The Pan-Canadian Assessment Program (PCAP) has since replaced SAIP, with its first assessment conducted in the spring of 2007 and the first report released in spring of 2008. PCAP is administered every three years. The Pan-Canadian Assessment Program evaluations help to determine whether students across Canada reach similar levels of performance at about the same age. Students' total scores in each subject area are transformed onto a common scale, ranging from 0 to 1000, with the average for the pan-Canadian population set at 500. Since this is a new assessment program, 2007 and 2010 are the only reporting years for which data has been released to date. Also, the only age-group measured thus far is 13 year-old students. As a result, the scores reflect a mere snap-shot of the provincial standing in standardized tests. It remains to be seen, as the program progresses and further data are collected, how the provinces fare in terms of improvements or changes on a comparative and time-series basis.

For the purposes of the Pan-Canadian Assessment Program (PCAP), three competencies are associated with demonstrating scientific literacy: science inquiry, problem solving and decision-making. Each of these competencies requires an understanding of the nature of science, applying relevant scientific knowledge, using skills and demonstrating attitudes as a reflection of scientific literacy.

Mathematics curricula within the various Canadian jurisdictions are similarly structured and based on a number of mathematical processes deemed essential to the effective study of the subject. These generally include problem solving, reasoning and justifying thinking, reflecting, using appropriate tools and computational strategies, making connections within and outside the discipline, representing and communicating mathematically.

In 2010 (the latest year for which data are available), the mean scores in science for students in Alberta (515) and Ontario (510) were much higher than those obtained by Canadian students overall (500). Despite having a mean score below the national average, B.C. students ranked third (mean of 497) in the country, up from a fifth-place ranking in 2007. Meanwhile, thirteen year-old students in Quebec (486) and Manitoba (486) scored the lowest.

INDICATOR E-3 (A): CANADA-WIDE RANK OF 13 YEAR-OLD ACHIEVEMENT IN SCIENCE (MEAN SCORES)

	2007	2007 Rank	2010	2010 Rank
Alberta	524	2	515	1
Ontario	499	4	510	2
British Columbia	**488**	**5**	**497**	**3**
Prince Edward Island	464	10	493	4
Nova Scotia	480	7	489	5
Saskatchewan	480	7	488	6
New Brunswick	564	1	487	7
Newfoundland and Labrador	485	6	487	7
Quebec	511	3	486	9
Manitoba	476	9	486	9
Canada	500	n/a	500	n/a

Data source: Council of Ministers of Education, Canada

B.C.'s young people rank third in the country in achievement in Science

In 2010, four of the high tech provinces took the top places nation-wide in student achievement in mathematics. Students in Quebec ranked first among the regions, with a mean score of 515, followed by Ontario (507) and Alberta (495). British Columbian students ranked fourth in the country (481), 13 points ahead of ninth-place Manitoba (468).

INDICATOR E-3(B): CANADA-WIDE RANK OF 13 YEAR-OLD ACHIEVEMENT IN MATHEMATICS (MEAN SCORES)

	2007	2007 Rank	2010	2010 Rank
Quebec	517	1	515	1
Ontario	506	2	507	2
Alberta	499	3	495	3
British Columbia	**484**	**4**	**481**	**4**
New Brunswick	461	7	478	5
Saskatchewan	461	7	474	6
Nova Scotia	457	9	474	6
Newfoundland and Labrador	478	6	472	8
Manitoba	479	5	468	9
Prince Edward Island	450	10	460	10
Canada	500	n/a	500	n/a

Data source: Council of Ministers of Education, Canada

B.C. students rank fourth in the country in mathematical achievement

3.3. Degrees Awarded

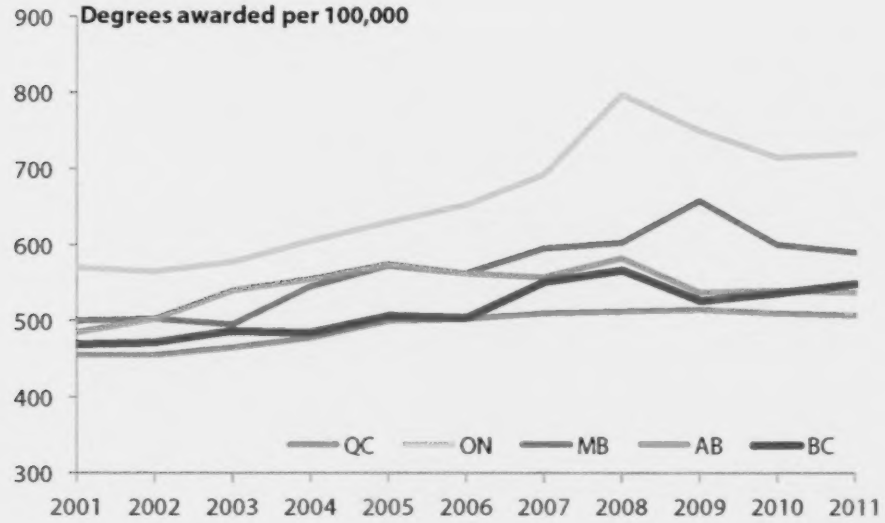
The indicators understood:

In a healthy economy, local industry provides jobs and the community provides the workforce to sustain the growth of the economy. Jobs in the high technology industry require specialized skills training. The number of degrees awarded within a given population is directly indicative of the potential human resources available to the province. Focusing on the degrees awarded on a per capita basis provides some indication of the overall education level of the province and the ability of the high tech sector to use these educated individuals. It is equally important to acknowledge the number of degrees awarded in absolute numbers. This is an indicator of the size of the domestic labour pool available from which high technology firms can draw and, ultimately, whether a province has sufficient qualified people to support an industry. Engineers, computer and information scientists, and physical and life scientists are driving forces behind the high technology sector. They provide a highly specialized form of labour that is integral to research and development. Looking at how well B.C.'s universities are doing to meet workforce demand and the interest in technology-related careers provides some measure of the province's capacity to supply the high tech economy. The geographical availability of people trained in these fields lowers the search costs for firms that demand these skills. Furthermore, individuals educated in such fields are often engaged in the design and integration of new technologies into a firm's business model.

The number of bachelor and graduate degrees awarded per capita is a direct indicator of the likely presence of skilled and educated professionals in a high technology economy.[5]

B.C. has consistently remained among the lowest of the provinces in terms of degrees granted per 100,000 persons; however, this pattern changed in 2011 (the latest year for which data is available). In that year, the number of bachelor degrees awarded per 100,000 people in the province climbed 2.3% from 2010 to 550, pushing the province ahead of Alberta (539) for the first time on record. B.C. was also ahead of Quebec (507), but remained a fair distance behind Ontario (720) and Manitoba (590). B.C. also fared well in absolute terms, awarding the third most degrees in the country. In 2011, universities in the province granted 21,402 bachelor degrees, compared to 16,650 in neighbouring Alberta.

INDICATOR E-4: TOTAL BACHELOR DEGREES AWARDED PER 100,000 PERSONS AGED 15 YEARS AND OLDER



Data source: Statistics Canada

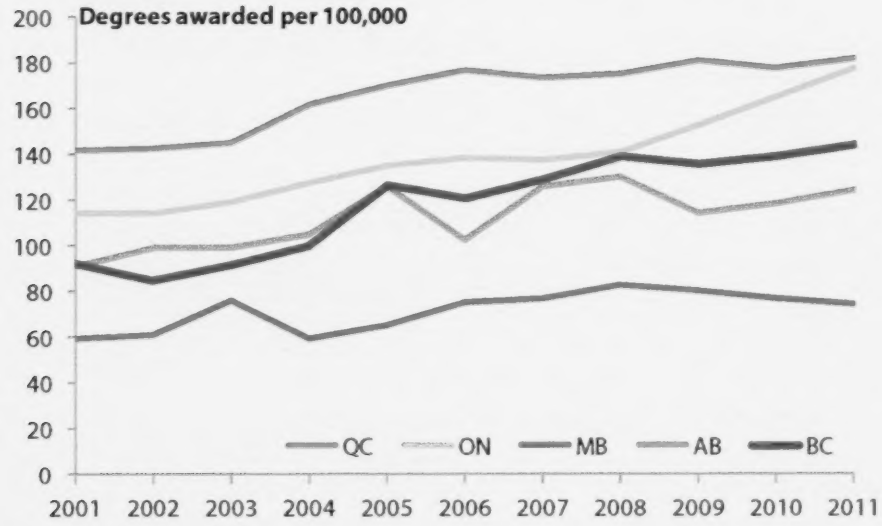
In 2011, B.C. awarded slightly more bachelor degrees per capita than Alberta and Quebec

[5] It is important to note that measuring the number of degrees awarded by British Columbia's institutions does not only measure degrees awarded to British Columbians. As such, this is not a perfect measure of the overall educational level of the population of British Columbia. Given the fact that students travel to various locations to pursue a post-secondary education, it is extremely difficult to measure how many British Columbians acquire a specific degree in a given year, and it is not feasible to know whether they return to B.C. after completing a degree elsewhere. Nonetheless, much of the student-body who attend the province's universities are, in fact, permanent residents of B.C. and the number of degrees granted by B.C.'s institutions is a direct indicator of the expertise of the labour pool available to the high technology sector regardless of where a student comes from. The number of degrees granted in B.C. is also an indicator of the appeal of the province's higher-education institutes and how many students from other provinces and around the world choose to pursue an education in British Columbia. Using a per capita calculation is a better gauge of B.C.'s performance in degree granting relative to other provinces.

Over the past decade, B.C. has seen an upswing in the number of graduate degrees granted, from 3,090 in 2001, to 5,589 in 2011. This solid increase has allowed B.C. to retain a third place ranking among the high tech provinces, well ahead of Alberta (3,834 in 2011).

In terms of graduate degrees per capita, Nova Scotia (258 degrees per 100,000 persons in 2011) has continuously outpaced the rest of the country over the past ten years. Among the high tech provinces, Quebec (182) remained the leader, while Ontario (178) also reported numbers higher than in B.C. (144), Alberta (124) and Manitoba (74).

INDICATOR E-5: TOTAL GRADUATE DEGREES AWARDED PER 100,000 PERSONS AGED 15 YEARS AND OLDER

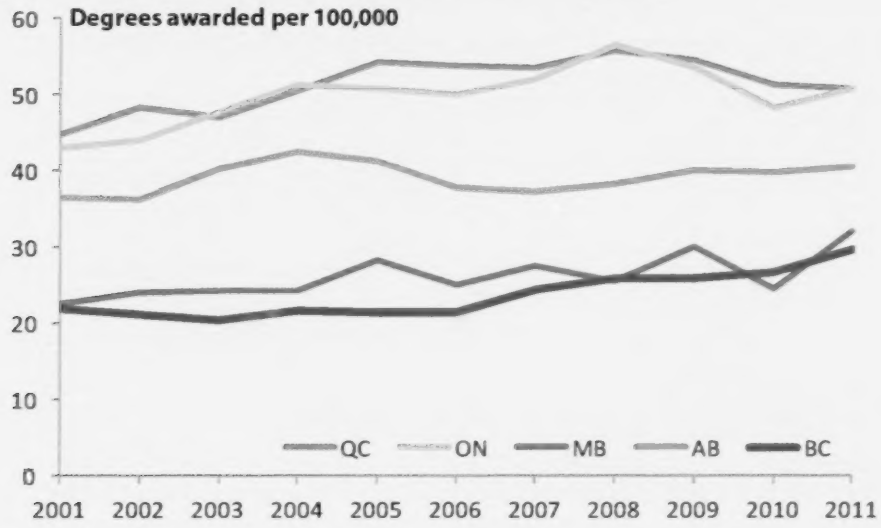


Data source: Statistics Canada

The number of graduate degrees awarded per capita in B.C. has climbed steadily over the past decade

Among specific disciplines, British Columbia tends to lag other high tech provinces in the number of bachelor and graduate degrees awarded per year. In 2011, on a per capita basis, the province ranked last among the high tech provinces in number of both bachelor and graduate degrees awarded to students of architecture, engineering and related technology. However, in actual numbers, the province has seen a noteworthy increase in graduates (of all levels) from this field over the past decade.

INDICATOR E-6: BACHELOR DEGREES AWARDED IN ARCHITECTURE, ENGINEERING AND RELATED TECHNOLOGY PER 100,000 PERSONS AGED 15 AND OLDER

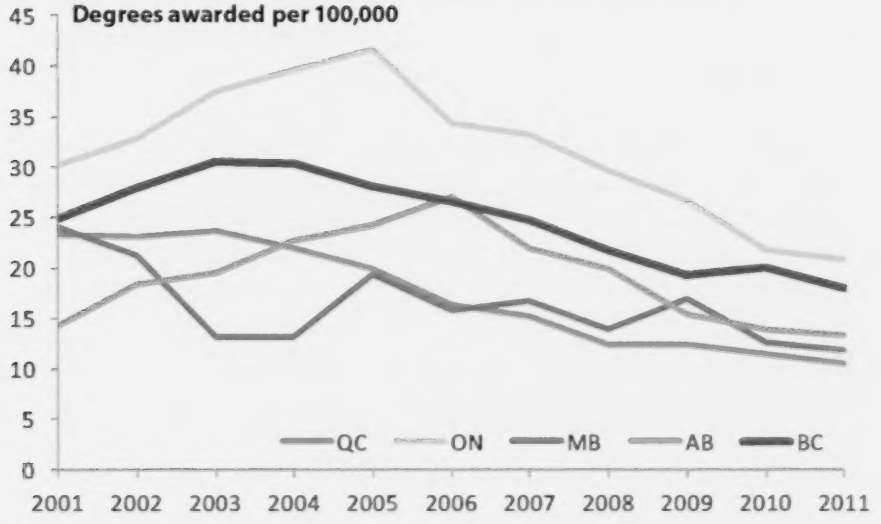


Data source: Statistics Canada

B.C. ranks last among the high tech provinces in architecture and engineering degrees awarded per capita

The province fares better in the number of bachelor degrees awarded in the area of mathematics, computer and information science. British Columbia's ratio (degrees per 100,000 population) is much higher than it was a decade ago and continues to rank second among the high technology provinces. Despite a decline recorded in 2011, the province's rate (18 per 100,000 persons) remained well above the Canadian average (16) for this indicator.

INDICATOR E-7: BACHELOR DEGREES AWARDED IN MATHEMATICS, COMPUTER AND INFORMATION SCIENCE PER 100,000 PERSONS AGED 15 YEARS AND OLDER



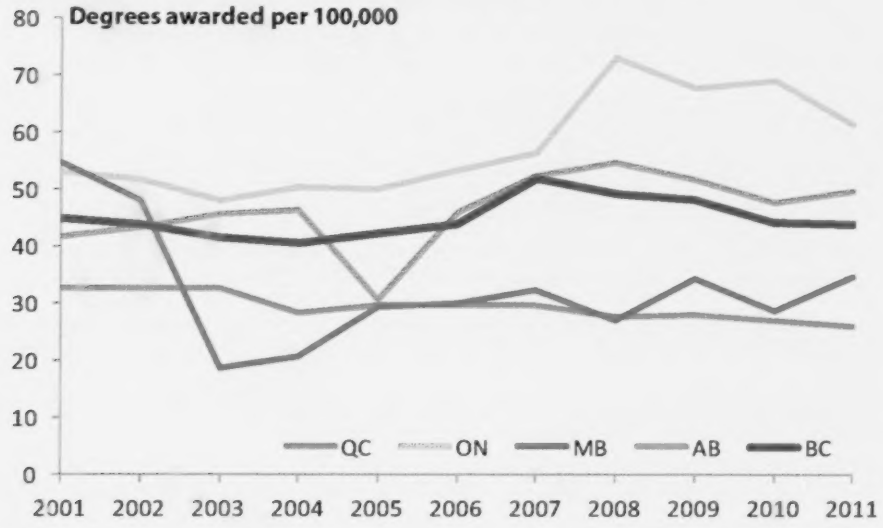
Data source: Statistics Canada

B.C. shows strength in bachelor degrees awarded per capita in math, computer and information sciences, raking second among the high tech provinces

In terms of graduate degrees awarded per 100,000 persons in this field of study, B.C. (8 in 2011) also ranked second among the high technology provinces, but below the national average (9).

At 44 per 100,000 persons in 2011, the number of B.C. graduates with a bachelor degree in the area of physical & life sciences & technologies fell short of the Canadian average (48).

INDICATOR E-8 BACHELOR DEGREES AWARDED IN PHYSICAL AND LIFE SCIENCES AND TECHNOLOGIES PER 100,000 PERSONS AGED 15 YEARS AND OLDER



Per capita degrees awarded annually in physical and life sciences and technologies fluctuate significantly in most provinces

Data source: Statistics Canada

In 2011, British Columbia awarded 12 graduate level degrees per 100,000 persons in physical & life sciences & technologies, outpacing four other provinces, but still sitting below the Canadian average (15).

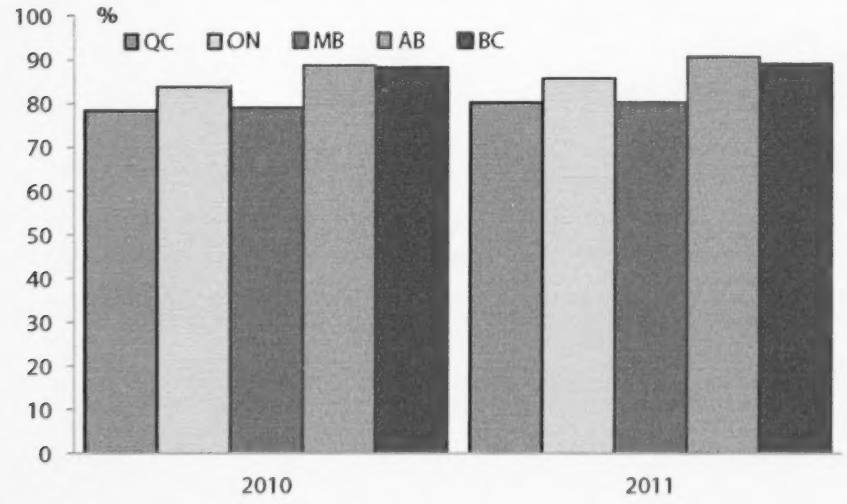
3.4. Technology Adoption

Why are these indicators important?

The rate of technology adoption is an indicator of the willingness of the population to employ the advantages afforded by high technology. High technology businesses are attracted to locations where the population tends toward higher rates of technology adoption. Greater familiarity with technology—for example, computer literacy—is likely to strengthen local market demand for high tech goods and services. Also, the acceptance of Internet and e-business technologies means small businesses can reach a world-wide market, reduce the time and cost per transaction and eliminate much of the capital investment required in typical operations.

As globalization and widespread popularity of new and innovative forms of communication expand, Canadians are making greater use of new information technologies at home and in the workplace. For example, households in every province across the country have increased their use of personal computers. In 2011, nearly 85% of the nation's homes had home computers, up from just 60% in 2001. The prevalence of home computers in B.C. has consistently been among the highest in the country, almost reaching the point of saturation in recent years. Indeed, in 2011, 89% of the province's households reported having a home computer, slightly behind Alberta (91%) but ahead of Ontario (86%), Manitoba (80%), Quebec (80%) and every other province.

INDICATOR E-9: PERCENTAGE OF HOUSEHOLDS WITH HOME COMPUTERS

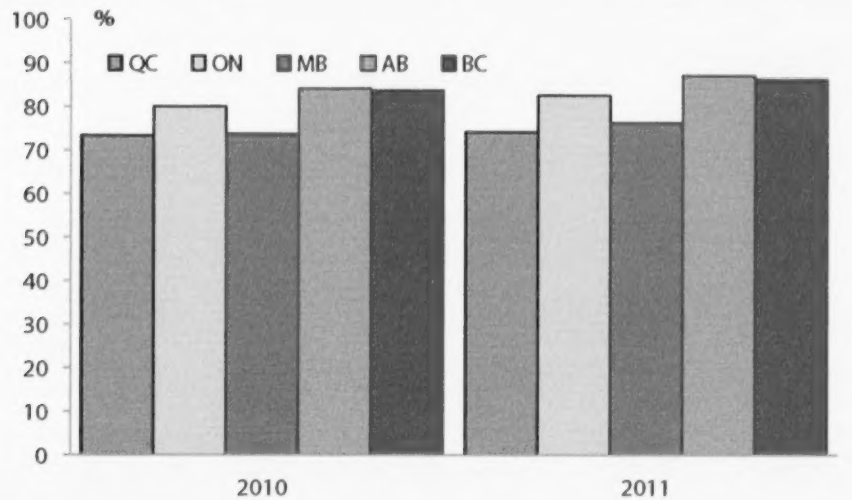


Data source: Statistics Canada

Alberta and B.C. have a larger share of households with home computers than other tech provinces

A similar picture emerges when one looks at the percentage of households having Internet access from home. From 2002 and 2009, British Columbia led the country in home Internet access. Despite being surpassed by Alberta in recent years, B.C. (86%) remained well above the Canadian average (81%) in 2011 and ahead of the other high tech provinces.

INDICATOR E-10: PERCENTAGE OF HOUSEHOLDS WITH INTERNET ACCESS FROM HOME



Data source: Statistics Canada

Households in B.C. and Alberta are the most likely in the country to have in-home Internet connections

3.5. Technology Licensing

Why are these indicators important?

University faculty members are at the forefront of research and their work often involves partnerships with the private sector for either expertise or equipment. This collaboration has many outcomes, including grants, contribution agreements and negotiated contracts whereby the institution and the researcher share in the payoffs. One way of measuring successful collaboration and research productivity is through university technology licenses. These licenses allow the institution to 'spin-off' the commercial aspect of the researcher's discovery, which provides income. Looking at the income per license provides a picture of the commercial success of the research. The number of U.S. patents issued to Canadian institutions and the creation of university start-up companies are also important indicators of future revenues.[6]

[6] As a caution, one must keep in mind that a key purpose of universities is to conduct "primary" research—work that does not have any immediate commercial application. This work, when successful, becomes the foundation of further applied research and development. A good example is the Human Genome Project,

In the mid-1980s, universities across Canada began opening industry liaison offices. Primarily, these offices are responsible for negotiating research and development collaborations with businesses and public and private organizations. They also work to ensure the protection of research work developed at the university, especially that with commercial potential. These offices work with industry to spin-off technology developed at the university into successful start-up companies.

Due in part to the volatile nature of innovative research, there has been a great deal of shuffling of ranks among Canada's major U-15 (formerly G-10 and G-13)[7] universities over the past decade. However, B.C.'s largest university has a history of pulling in more income from technology licensing than most other Canadian universities. With a gross income of nearly $8.4 million from technology licences in 2011, the University of British Columbia was ahead of the country's other top research universities in technology licensing. The University of Saskatchewan ranked second, with $6.9 million in income from technology licensing, followed by the University of Western Ontario ($4.3 million) and the University of Alberta ($3.7 million).[8]

In 2011, UBC also led other universities in the number of licenses yielding income, but was below Dalhousie University, the University of Saskatchewan, the University of Alberta, and the University of Western Ontario in terms of the average gross income per technology license.

UBC is not the only university in the province to show promise in technology licensing in recent years. Although not classified as U-15 universities, Simon Fraser University (SFU) and the University of Victoria (UVic) have also made strides. In 2011, SFU received a gross income of $1.4 million from technology licenses, while UVic received

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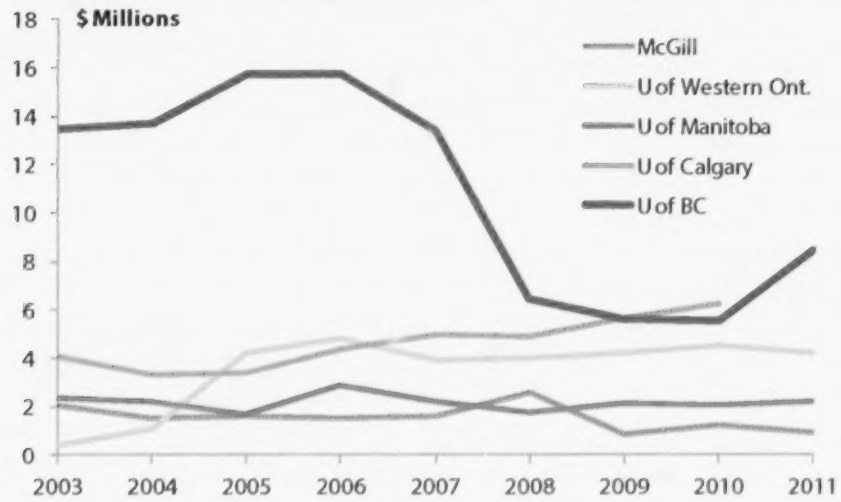
which recently completed mapping out the genetic structure of the human being. Thus, licensing only provides a partial view of the importance of university research in the high tech sector.

[7] 'U-15' Universities are the leading research universities in Canada and originally included the following institutions as part of the 'G-10' group: University of British Columbia (B.C.), University of Alberta (Alberta), University of Toronto (Ontario), Queens University (Ontario), University of Waterloo (Ontario), McMaster University (Ontario), University of Western Ontario (Ontario), Université de Montréal (Quebec), McGill University (Quebec), and Université Laval (Quebec). As of 2006, three more universities were added to the group, expanding it from 10 institutions to 13. The three universities added were: University of Calgary, Dalhousie University and University of Ottawa. In 2011, a further two institutions were added (University of Manitoba and University of Saskatchewan) and the group was renamed 'U-15.' The data for these and some other universities do not go back as far as the original ten. Note also that there are some other Canadian institutions that are highly active in technology research, but are not members of the U-15 group and, as such, are not included in this analysis.

[8] It should be noted that in 2011, data for the University of Calgary was unavailable. This institution has performed strongly in the past and ranked first in the country in 2010.

$533,000. SFU yielded an average of $173,000 per technology license in 2011, significantly higher than UVic's average ($44,000).

INDICATOR E-11: GROSS INCOME FROM TECHNOLOGY LICENSES (IN MILLIONS OF $CDN) AT TOP-PERFORMING U-15 UNIVERSITY IN EACH HIGH TECH PROVINCE



Note: Data for the University of Calgary for 2011 are unavailable.
Data source: Association of University Technology Managers

Licensing income at UBC is well above other leading Canadian institutions

Over the past decade, British Columbia has consistently shown strong results in terms of the number of U.S. patents awarded to its top research institution (UBC). Acquiring a cumulative 73 patents between 2007 and 2011, B.C. ranked third among the high tech provinces in terms of the number of patents granted in the last five reporting years. Over the same period, Ontario (213) led the pack, followed by Quebec (148).

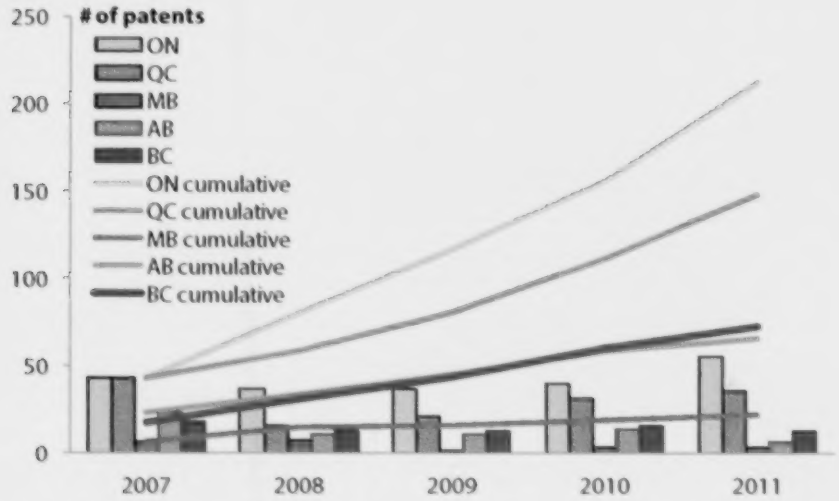
The number of patents issued in the province is even more impressive when one considers that B.C., like Manitoba, is home to only one of Canada's U-15 universities, whereas Alberta has two and Quebec and Ontario are each home to several. Moreover, when one compares individual institutions, UBC (73) was second only to University of Toronto (74) in cumulative patents awarded between 2007 and 2011. The next highest cumulative total was 66 for McGill University, followed by 46 for Queens University.

Looking beyond national borders, British Columbia also holds up favourably. In comparison to U.S. universities, UBC has been gaining ground in patent acquisitions. The 13 U.S. patents issued to B.C.'s top research university in 2011 matched the number granted to several American institutes, including the University of Louisville and the University of Vermont. Of the 219 U.S. and Canadian universities included in the survey, only 90 were ranked higher than UBC, with five universities acquiring in excess

of 100 patents in 2011. The University of California System was awarded 343 patents, followed by the Massachusetts Institute of Technology (174). The number of patents issued to UBC in 2011 exceeded that of over 100 other U.S. universities surveyed.

Simon Fraser University and the University of Victoria added to the overall patents issued in B.C.'s higher education sector in 2011, receiving five and seven patents, respectively.

INDICATOR E-12: U.S. PATENTS ISSUED TO SELECTED INSTITUTIONS, ACTUAL AND CUMULATIVE[9]



Note: Data for the University of Calgary for 2011 are unavailable and are not included in Alberta figures.
Data source: Association of University Technology Managers

Between 2007 and 2011, UBS has ranked among the top few universities in the country in terms of patents issued

Academic discovery fuels the formation of new and innovative business. Start-up companies[10] are a major part of the innovation process as firms that are already established are often unwilling or unable to adopt new, high-risk technologies. It is often feared that new technologies will render existing investments and technologies obsolete. Start-up company activity is a significant component of the technology licensing process. In 2011, 55 new companies were formed nation-wide based on academic discovery.

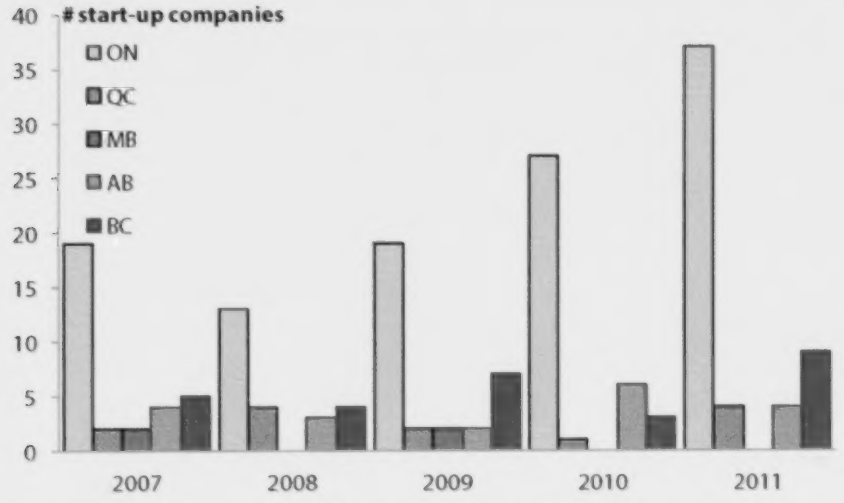
There have been significant shifts in rankings among Canada's major U-15 universities over the past decade. The University of British Columbia reported nine new start-up

[9] Data includes all U-15 universities from each respective high tech province.

[10] The Association of University Technology Managers' (AUTM) definition for start-up activity relates specifically to a company formed solely around the licensing of technology into a newly formed company. Some new ventures that stem from Canada's institutions are not captured by this definition but are perhaps equally as fundamental to the financial and economic development of the institution as well as the economic region.

companies in 2011, second only to the University of Toronto (23) for the highest number of new businesses among the U-15 universities.

INDICATOR E-13: UNIVERSITY START-UP COMPANIES FORMED BY SELECTED INSTITUTIONS, BY PROVINCE[11]



Note: Data for the University of Calgary for 2011 are unavailable and are not included in Alberta figures.
Data source: Association of University Technology Managers

In 2011, B.C.'s single U-15 university formed more than twice as many start-up companies as Quebec's three U-15 universities combined

3.6. Performance of R&D by the Higher Education Sector

Why is this indicator important?

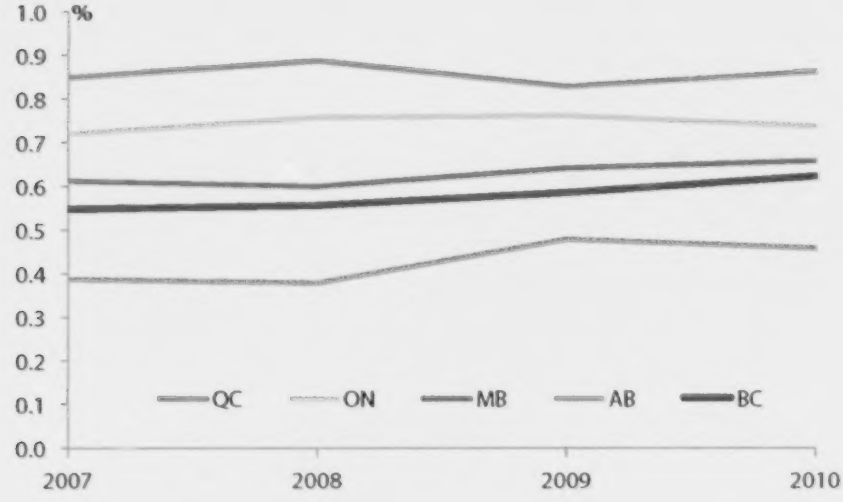
Research and development at universities contribute to high technology's impact on the economy in two ways. Published academic research is available to the public so that it can be used as a resource. Universities are also increasing partnerships with industry to bring the products and processes of R&D to market (see 'Technology Licensing'). The ratio of R&D performed by the higher education sector (HERD) to gross domestic product (GDP) is an indicator of the proportional investment in R&D by this sector relative to the size of the overall economy. A higher proportion of investment is likely to lead to higher rates of discovery.

In 2010, the higher education sector in Canada performed over $11.4 billion worth of R&D, up from $10.8 billion in 2009. The total in 2010 amounted to 0.7% of Canada's GDP in that year, unchanged from the previous year.

[11] Data includes all U-15 universities from each respective high tech province.

The ratio of R&D performed by the higher education sector to provincial GDP was highest in Quebec (0.9%) and lowest in Alberta (0.5%). Ontario's ratio was steady in 2010, holding onto its second-place rank among the high tech provinces, followed by Manitoba in third. B.C.'s ratio remained stable at 0.6% ($1.3 billion) to rank fourth.

INDICATOR E-14: RATIO OF HIGHER EDUCATION PERFORMANCE OF R&D TO GDP



Among the high tech provinces, B.C. ranks fourth in ratio of higher education R&D to GDP

Data source: Statistics Canada

3.7. Research Funding

The indicators explained:

Funding for research in high technology industries not only supports current research within the economy, but also plays an integral role in attracting new researchers and encouraging a more innovative landscape. Funding is crucial in order to enhance Canada's reputation as a destination of choice for researchers and to make universities even more competitive in attracting prominent and competent researchers from around the world. Measurements of overall research funding for sectors pertaining to the scientific community and the distribution of the nation's Research Chairs are good indicators of the attractiveness of B.C.'s research environment.

In 2000, the Government of Canada created a new permanent program to establish 2,000 research professorships—Canada Research Chairs (CRC)—in universities across the country. The Canada Research Chairs Program invests $300 million each year to assist universities in recruiting and retaining the most brilliant and promising scientists and researchers, helping these institutions become global leaders in the fields of advanced science and technology. Chairholders aim to achieve research excellence in

engineering and the natural sciences, health sciences, humanities and social sciences. The Chairs Program imposes no restrictions on nominees with regard to nationality or country of residence, and as such, many foreign researchers are taking up chairs in Canada, including in British Columbia. The Canada Research Chairs Program offers eligible Canadian degree-granting institutions the opportunity to nominate outstanding researchers for senior professorships in areas that will further the institution's overall research priorities and enable them to maximize their contributions as centres of research and research training.

The CRC's Steering Committee includes several organizations that operate separately from the CRC, but which fund research undertaken by chairholders. These organizations are integral to the CRC program. The Canadian Institutes of Health Research (CIHR), the Canadian Foundation for Innovation (CFI), and the Natural Sciences and Engineering Research Council of Canada (NSERC) are among those groups that oversee and contribute to the CRC program.

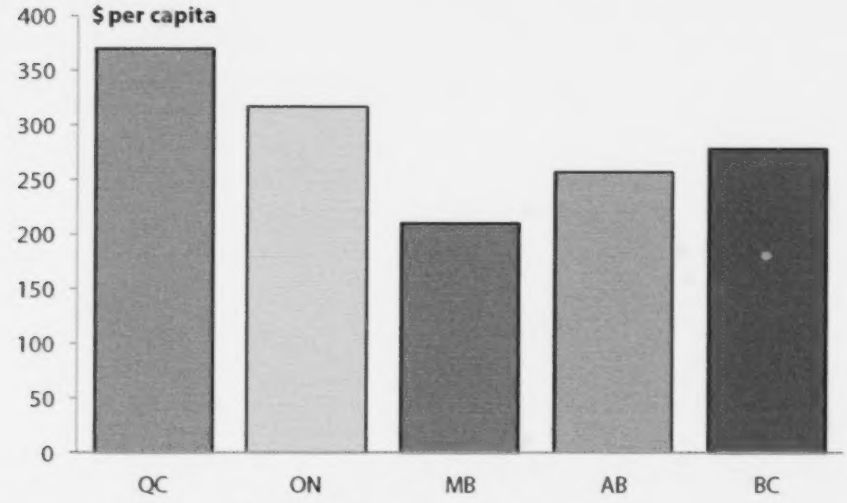
CIHR is the major federal agency responsible for funding health research in Canada; NSERC is the national instrument for making strategic investments in Canada's capability in science and technology; and CFI is an independent corporation established by the Government of Canada to strengthen national research capability through investments in research infrastructure in Canadian universities, colleges, hospitals and eligible not-for-profit organizations.

Measures of funding for research and skill development in the public and private sectors are direct indicators of the strength and sustainability of a province's research and development status. British Columbia's academic institutions have consistently received substantial funding from government and arms length organizations for research conducted. Academic institutions in the province receive above average funding in some research areas, but below average in others.

Since 2000, up to and including the 2013/14 funding year, B.C.'s researchers have received an accumulation of over 4,759 grants and awards from the Canadian Institute of Health Research (CIHR). Combined, these awards amounted to a cumulative $1.3 billion in funding and 13% of the national funding over the same period. Quebec (29%) and Ontario (41%) receive the bulk of funding, while Alberta (10%) and Manitoba (3%) see smaller shares. Grants and awards received in British Columbia averaged $278,300 per award, slightly lower than the national average of $285,100. Among the other high tech provinces, the highest average award amounts were granted to institutions in Ontario ($296,200 per award), followed by Alberta ($293,900), Quebec ($293,600) and Manitoba ($243,600).

On a per capita basis, Quebec ($371) receives the most funding, followed by Ontario ($317). With $279 per capita in funding, B.C. receives substantially more than Manitoba ($211), but just slightly more than neighbouring Alberta ($257).

INDICATOR E-15: PER CAPITA FUNDING OF CIHR GRANTS AND AWARDS, CUMULATIVE UP TO 2013/14[12]



Data source: Canadian Institute of Health Research

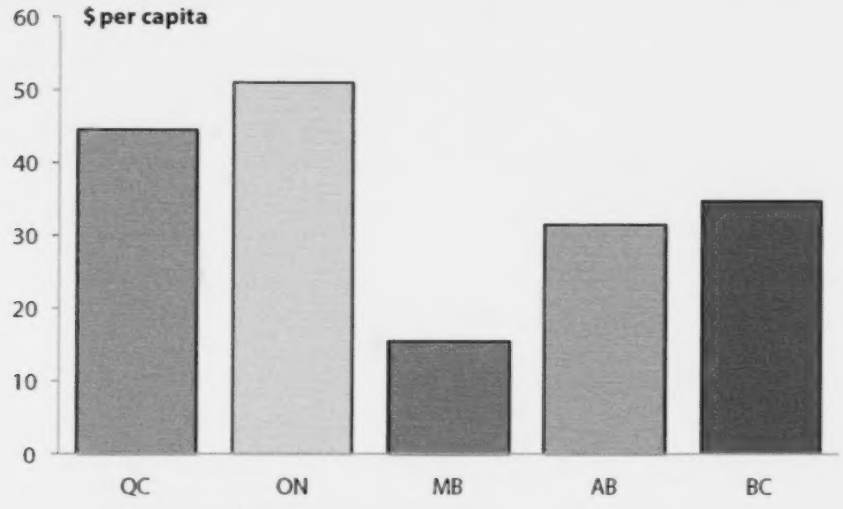
Quebec has the highest per capita funding from CIHR grants and awards

When one looks at average funding for projects in the health and natural sciences and engineering research sectors, B.C. has mixed results. As of 2012/13, the Canadian Foundation for Innovation (CFI) had funded a cumulative 1,493 health science research projects among Canada's institutes, totalling over $1.4 billion. B.C. was the recipient of funding for 174 of these projects, receiving a total of $161 million (11% of the national funding in this research sector). The average funding per project was $924,000 in B.C., slightly below the national average ($947,000).

Per capita, B.C. ($35) ranked a solid third among the high tech provinces, receiving less than its easternmost high tech counterparts ($45 in Quebec and $51 in Ontario), but more than both Alberta ($32) and Manitoba ($16).

[12] Cumulative funding since program inception (2000) up to and including fiscal year 2013/14. Per capita totals are calculated using projected population data as at July 1st, 2013.

INDICATOR E-16(A): PER CAPITA CFI FUNDING FOR HEALTH RESEARCH, CUMULATIVE TO 2012/13[13]



Data source: Canadian Foundation for Innovation

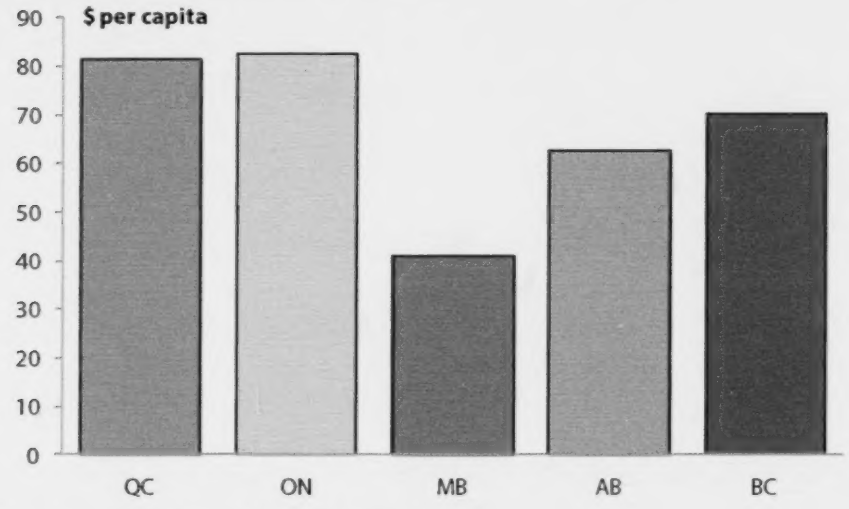
B.C. ranks third among the high tech provinces in per capita CFI funding for health research

Over the same period, the CIHR funded a total of 5,616 projects in the natural sciences and engineering research sector across the country, amounting to nearly $2.7 billion in funds. B.C. institutions were the recipient of more than $324 million of this funding (684 projects), 12% of the overall resources. B.C. received an average of $474,000 per project, just below the national average ($475,000).

In dollars per capita, funding received in B.C. translates to about $70, slightly more than Alberta ($63) and well above Manitoba ($41). Meanwhile, Quebec and Ontario (each $82) had notably higher per capita award amounts in this sector.

[13] Cumulative funding since program onset (1997) up to and including fiscal year 2012/13. Per capita totals are calculated using population data as at July 1st, 2012.

INDICATOR E-16(B): PER CAPITA CFI FUNDING FOR NATURAL SCIENCES AND ENGINEERING RESEARCH, CUMULATIVE TO 2012/13[14]



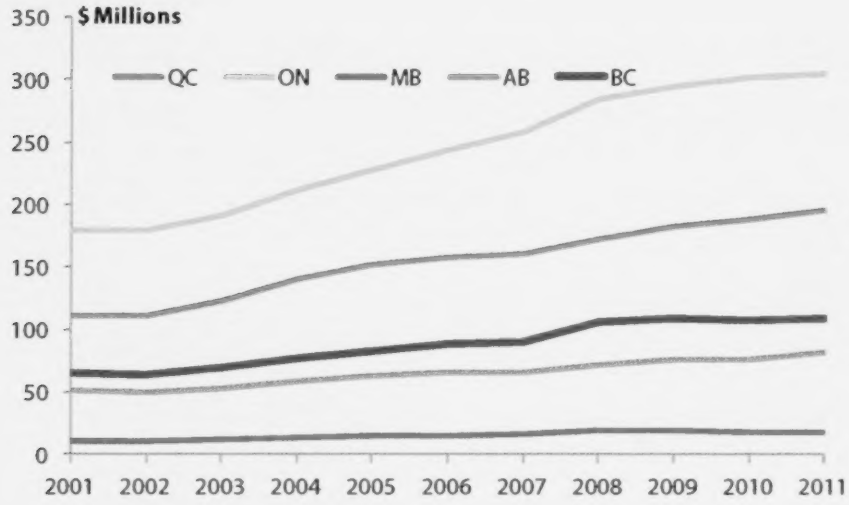
Data source: Canadian Foundation for Innovation

Of the high tech provinces, Ontario receives the highest per capita funding for natural sciences and engineering research

In 2010/11, the National Sciences and Engineering Research Council of Canada (NSERC) recorded $794 million in expenditures on grants and scholarships, up 1.5% from the previous year. With the exception of Manitoba, which has experienced volatility, funding for the high tech provinces has climbed steadily over the last five reporting years. Ontario and Quebec received two thirds of overall funding in 2010/11 (a combined 63% or $500 million). In the same year, B.C. was the recipient of almost $109 million (14% of the national total) in funding from the NSERC. The province remained well above Alberta ($82 million, or 10% of the national total in 2010/11) in total funding received. In 2010/11, B.C. ($24) was also higher than the national average ($23) in NERSC scholarship funding received per capita.

[14] Cumulative funding since program onset (1997) up to and including fiscal year 2010/11. Per capita totals are calculated using population data as at July 1st, 2010.

INDICATOR E-17: GROWTH IN NSERC-FUNDED GRANTS AND SCHOLARSHIPS, 2000/2001 TO 2010/2011

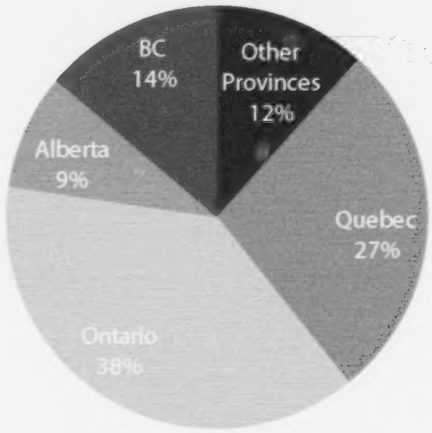


B.C. remains well above Alberta and Manitoba in NSERC-funded grants and scholarships

Data source: The Natural Sciences and Engineering Research Council of Canada

Since the Canada Research Chairs (CRC) Program and its committees maintain high standards of excellence for appointees, the ability to fill the chairs is a solid indicator of the attractiveness of the province's research community. In 2013, of the 1,769 CRCs currently in place at Canadian universities, 244 are at B.C. institutions. This accounts for 14% of Canada's chairs, more than Atlantic Canada, Saskatchewan and Manitoba combined. Across the country, 17% of chairholders (307) have been recruited from outside of Canada. Of B.C.'s Chairs, 61 (25%) are from outside of Canada, including 27 expatriates and 34 international recruits. The province is above the national average in the number of female chairholders, with nearly a third (30%) fitting this description. Nation-wide, 26% of chairholders are women, with the highest proportion found in Newfoundland & Labrador (33%) and P.E.I. (40%).

INDICATOR E-18: DISTRIBUTION OF CANADA RESEARCH CHAIRS, 2013



B.C. is home to more Canada Research Chairs than Saskatchewan, Manitoba and the Atlantic provinces combined

Data source: Canada Research Chairs Program

4. Business Indicators

This set of indicators is concerned with the stimulus to business formation and growth that comes from internal research and development (R&D), patenting and venture capital. It also measures results that are in part due to these stimuli, in the form of business entries and exits, high growth companies and the overall growth in the number of establishments.

British Columbia returns above average ratings compared to other provinces in some of the business stimulus indicators. Conversely, some indicators show less promise.

TABLE 3: QUICK SUMMARY OF INDICATORS FOR THE BUSINESS SECTOR

INDICATORS	Trend		Ranking	
	Long-Term	Latest Year	Five High Tech Provs.	Overall
B-1: Patents per 100,000 persons	→	↑	4 of 5	5 of 10
B-2: Patents granted as a % of applications, 3 year average	↑	↑	5 of 5	6 of 10
B-3: Entries to the high tech sector	→	↑	n/a	n/a
B-4: Exits from the high tech sector	↑	↑	n/a	n/a
B-5: High growth high tech companies	→	↓	n/a	n/a
B-6: Venture capital investment, total#		↑	3 of 5	3 of 7
B-7: Venture capital investment: share of Canadian total#	→	↓	3 of 5	3 of 7
B-8: Business expenditure on R&D (BERD) to GDP		↓	3 of 5	3 of 10

The overall ranking is out of 7 because the Atlantic Provinces are grouped together as one.

4.1. Patents and Applications

Why are these indicators important?

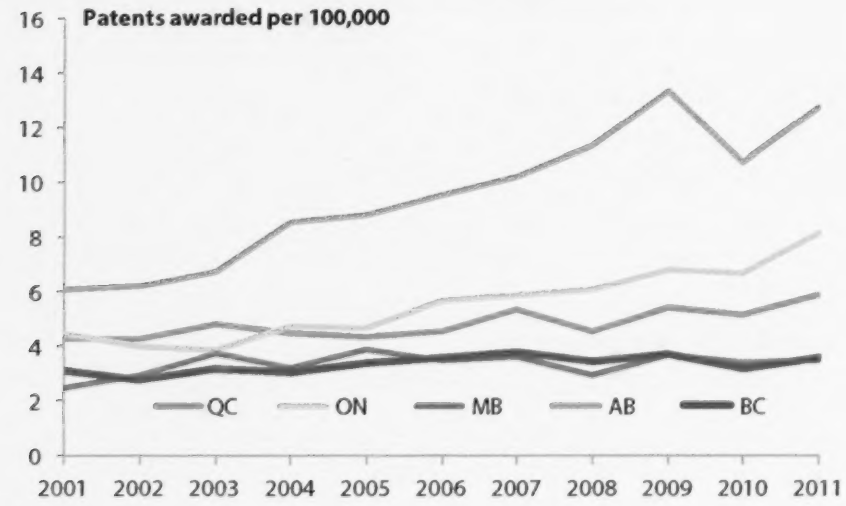
Patents are an indicator of the intellectual capital of innovation. According to the Canadian Intellectual Property Office, their mandate is to "grant patents which will result in the protection of the inventor and dissemination of technical information, and the encouragement of the creation, adoption, and exploitation of inventions." Patent applications may be rejected for a number of reasons, "including lack of novelty, obviousness, and lack of patentable subject matter." Patents are key resources for researchers, academics and businesses that need to stay shoulder-to-shoulder with developments in their fields.

Applications and granting of patents are indicators of the success of research and development, whether in the public or private sector. Over the most recent reporting years, British Columbia has consistently lagged most of the other high technology

provinces in terms of patents awarded per 100,000 persons. The acceptance rate of B.C. patent applications also remains below average.

Compared to the other high technology provinces, British Columbia has not been highly successful in patenting new inventions. In 2011, B.C. applicants were awarded 165 patents, or 3.6 per 100,000 population. Since 2000, Alberta has maintained a first place rank in patents granted per capita. In 2011, Alberta boasted 12.7 patent awards per 100,000 persons, well ahead any other province. Quebec (5.9) and Ontario (8.2) also had relatively high patent rates compared to B.C., while, at 3.5, Manitoba was just slightly behind.

INDICATOR B-1: PATENTS AWARDED PER 100,000 POPULATION



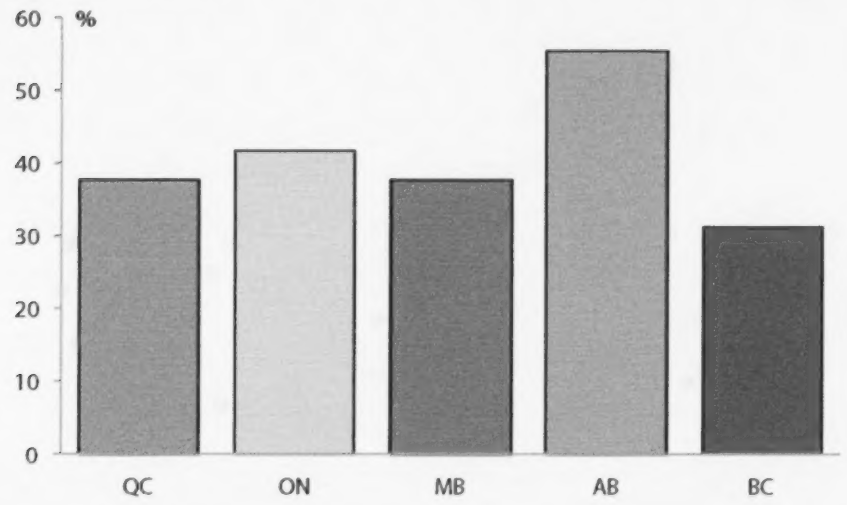
Alberta out ranks the high technology provinces in patents awarded per capita

Data source: Canadian Intellectual Property Office

Patent applications are rejected far more frequently than they are accepted. Between 2009 and 2011, merely 41% of patent applications were accepted in Canada. The low acceptance rates across the country suggest that applicants generally begin the process of applying for a patent with little knowledge of the procedure(s) or of their chances of success. This pattern seems somewhat more common in British Columbia. In B.C., only 31% of applications resulted in the issuing of a patent in the 2009 to 2011 period.[15] This is substantially lower than for Alberta (56%) and Ontario (42%) and slightly below the averages in Quebec and Manitoba (each 38%).

[15] Patent applications take an average of 25 months to be processed. Thus, to know how many applications filed in 2009 were accepted, one must look at patents granted in 2011. Figures presented here show patent grants in 2011 as a percent of applications in 2009.

INDICATOR B-2: PATENTS GRANTED AS A PERCENT OF PATENT APPLICATIONS (THREE-YEAR AVERAGE, 2009-2011)



Alberta also has the highest rate of acceptance for patent applications

Data source: Canadian Intellectual Property Office

4.2. Sector Dynamism: Entries and Exits[16]

Why are these indicators important?

A dynamic sector, characterized by a healthy mixture of large and small, old and new firms, is ideal for generating high levels of innovation. Large, established firms provide employment and earnings stability while small start-ups often provide market responsiveness, creativity and employment growth. The high technology labour force is combined with capital and ideas in the drive to generate new goods and services. A stagnant sector, characterized by several large firms and low levels of entry and exit, is not likely to generate high levels of innovation.

High tech sector entry rates indicate the percentage of firms currently in the sector that are new (i.e., did not exist in the previous year). Similarly, exit rates show how many firms left the high tech sector (or went out of business) as a percentage of the total number of high tech firms.[17] Note that only companies with employees are included in these data.

[16] Note that a comparison with other provinces for indicators B-3, B-4 and B-5 is not possible because of lack of accessibility to the necessary data.

[17] With the release of the 2008 data, Statistics Canada introduced the concept of a statistical "location" replacing statistical "establishment." The location, as a statistical unit, is defined as a producing unit at a single geographic location at which, or from which, economic activity is conducted and for which, at minimum, employment data are available. The change to business location counts was made because they

Innovation is integral to the high tech sector. Along with an innovative spirit comes a somewhat volatile environment for businesses. One consequence of this is a high rate of business failures. On the other hand, small start-up firms in high tech are often at the leading edge of innovation, and are crucial to the ongoing strength of the sector.

A good way to measure the strength of a specific sector is to compare it to the overall economy. The number of high technology firms grew at an average annual rate of 15.0% between 2007 and 2012, expanding by nearly 200 establishments to 9,010. By contrast, the number of firms in the B.C. economy as a whole had a significantly lower average annual growth rate (+11.2%). Similarly, the exit rate in the province's high tech sector (+14.2%) was also higher than the average business exit rate (+10.8%), suggesting that the innovative atmosphere of high tech businesses in the province tends to lead to volatility. High exit rates are not necessarily a sign of long-term trouble in the high tech sector, as this type of competitive environment is often a marker of high levels of innovation.

Entries into the high technology sector have exceeded exits in three of the last five reporting years, such that the overall number of high technology establishments has been growing fairly steadily. This was especially true in 2012, as entry rates (19.2%) jumped to nearly three percentage points higher than exit rates (16.3%). The gap between businesses entering the high tech sector and those leaving is much larger than those for all B.C. establishments and the number of high technology establishments exhibits growth at a rate exceeding that of the economy as a whole.[18]

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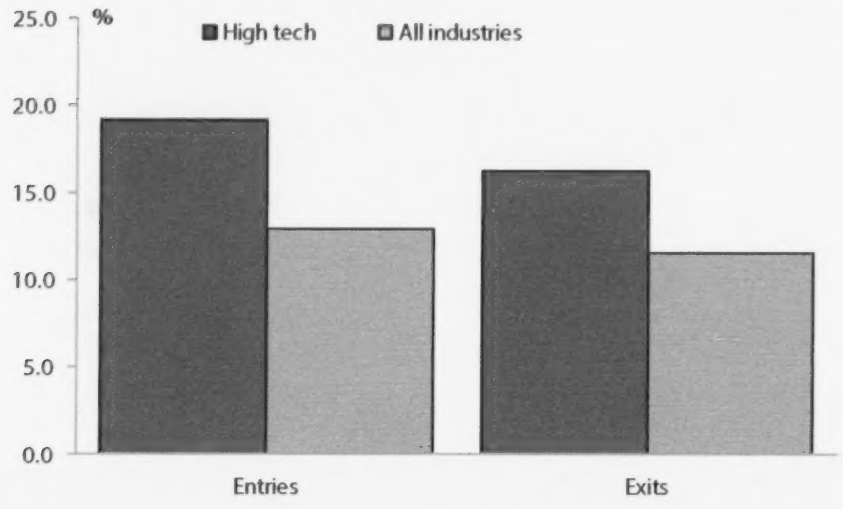
provide a better measurement of actual business units. One consequence of this change is that location data prior to 2007 are not available.

[18] While data by statistical location are not available prior to 2007, data from the old statistical establishment framework indicate that business counts have been growing at a faster rate in the high tech sector.

INDICATORS B-3 AND B-4: ENTRY AND EXIT RATES IN THE HIGH TECH SECTOR COMPARED TO ALL INDUSTRIES, 2012



Entry and exit rates are higher than average in the high tech sector

Data source: BC Stats

4.3. High Growth Companies

The indicator explained:

High levels of growth are strong indicators of the success of a sector. An increasing number of high growth companies will create new jobs, new wealth and new government revenues.

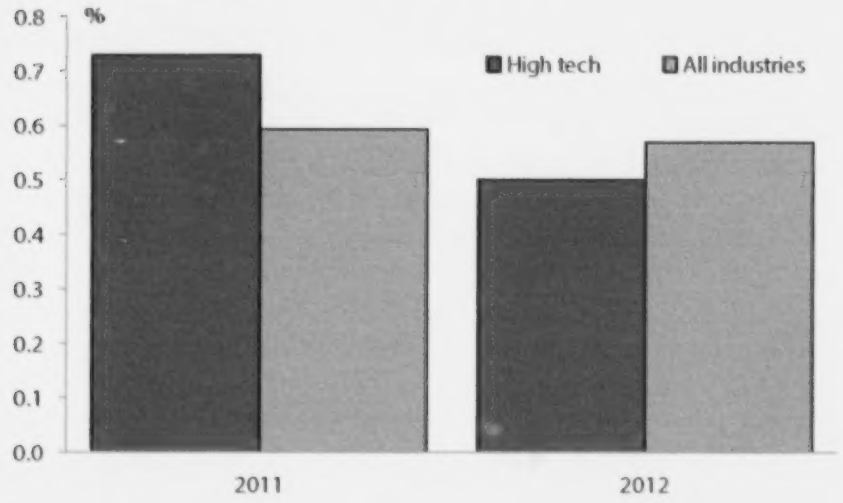
BC Stats defines "high growth companies" as those which increase by at least two employment size categories in one year. For example, a firm that has one to four employees would be considered high growth if it expanded to have 10 to 19 employees over the course of one year. Similarly, a company with 100-149 workers expanding to 200-249 workers would also be considered high growth. There are 21 employment size categories, which provide a considerable amount of detail. However it should be cautioned that, because the exact number of workers in a firm is not known, this measure will be somewhat imprecise. Further, because the last employment category is "5,000 and over," it is impossible for a large corporation to be classified as high growth. These data, then, principally apply to small and medium-sized establishments.

The high technology sector is often thought to be a breeding ground for rapid-growth firms—small start-up companies that grow exponentially in short periods of time. Very few companies qualify as "high growth," but they can be slightly more common in the high tech sector than elsewhere. In recent years, however, high tech businesses in British

Columbia have displayed patterns of high growth similar to that of the economy as a whole.

In 2012, 0.6% of all companies in B.C. showed rapid growth in number of employees, unchanged from 2011. The share of high growth companies has remained fairly stable over the last five reporting years. The percentage of high growth companies in B.C.'s high technology sector (0.5% high growth in 2012) remained relatively on par with B.C. businesses as a whole from 2008 to 2012. In actual numbers, there were 1,000 high growth businesses in the overall provincial economy in 2012 and about 45 for the high tech sector alone.

INDICATOR B-5: HIGH GROWTH COMPANIES FOR THE HIGH TECH SECTOR AND FOR ALL INDUSTRIES, 2011 AND 2012



Data source: BC Stats

In 2012, the high tech sectorhas a slightly lower share of companies that are classified as high growth than the economy as a whole

4.4. Venture Capital Investment

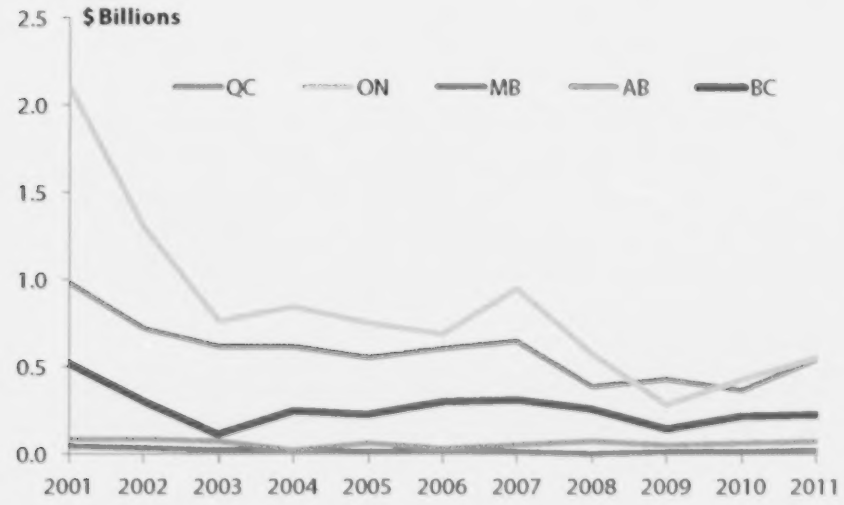
Why are these indicators important?

Venture capitalists specialize in investing in high-risk company start-ups or expansions, providing the seed funds for projects that are often involved in the development of new products or processes. They take a portfolio approach, such that, while many high-risk investments may never be commercially viable, those that do succeed are expected to provide high returns to compensate for the total risk capital invested across the portfolio. Thus, venture capital (VC) investment by province gives an indication of both the quality of ventures in a given province and the investors' assessment of the business climate. It also reflects the risk tolerance of investors in different regions and over time.

Venture capital investment has historically been characterized by boom or bust volatility. Canadian venture capital investment[19] declined in the early half of the 2000s, following an explosion in Canadian venture capital investment during the latter part of the 1990s. Over the first few years of the new decade, investment began to fall and, since then, overall investment has been somewhat unpredictable. In 2001, venture capital investment in Canada amounted to $3.8 billion and by 2009, it had fallen to $1.0 billion, its lowest point in a decade. However, the following two years showed more promise, with investment reaching $1.5 billion in 2011.

In 2011, venture capital in B.C. attracted $226 million in investment income, compared to $74 million in Alberta and $25 million in Manitoba. However, this was still considerably less than in Quebec ($549 million) and Ontario ($550 million).

INDICATOR B-6: CANADIAN VENTURE CAPITAL INVESTMENT BY PROVINCE OF INVESTMENT ($ BILLION)



Data source: Canadian Venture Capital Association

Overall venture capital investment in B.C. has been relatively stable in recent years, allowing the province to maintain a solid rank of third among the high tech provinces

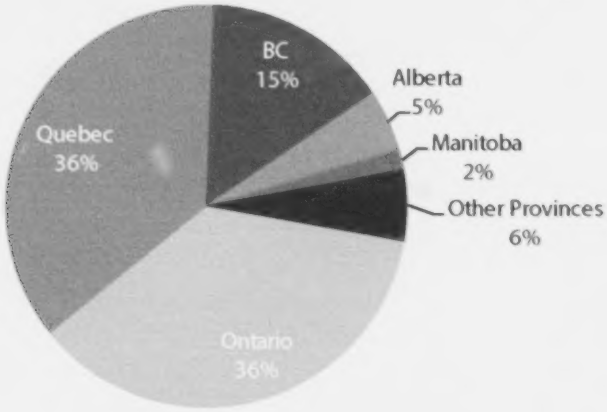
British Columbia fares even more promisingly in terms of investments per capita, usually ranking above the national average. In 2011, the province boasted an average venture capital investment of over $49 per 100,000 population, more than double that of Alberta ($20) and Manitoba ($20) and considerably higher than Ontario ($41). Quebec recorded the highest per capita investment ratio in the country ($69) and was the only other province to exceed the national average ($44).

[19] Most of the other potential financing indicators, such as debt financing, are either available only for Canada with no provincial breakdown, or do not provide sufficient years of reporting to establish trends and are therefore not included in this report.

In 2011, B.C. held a 15% share of the country's venture capital investment, down nearly five percentage points from 2010, but still a far greater portion than in any other province outside Canada's industrial core. Indeed, the amount of investment in B.C. far exceeded that of Alberta, Saskatchewan, Manitoba and Atlantic Canada combined. Ontario (36%) and Quebec (36%) retained the largest share of the country's venture capital investment.

INDICATOR B-7: SHARE OF CANADIAN VENTURE CAPITAL INVESTMENT, 2011

B.C.'s share of Canadian venture capital investment is three times that of Alberta



Data source: Canadian Venture Capital Association

4.5. Performance of R&D by the Business Sector

Why is this indicator important?

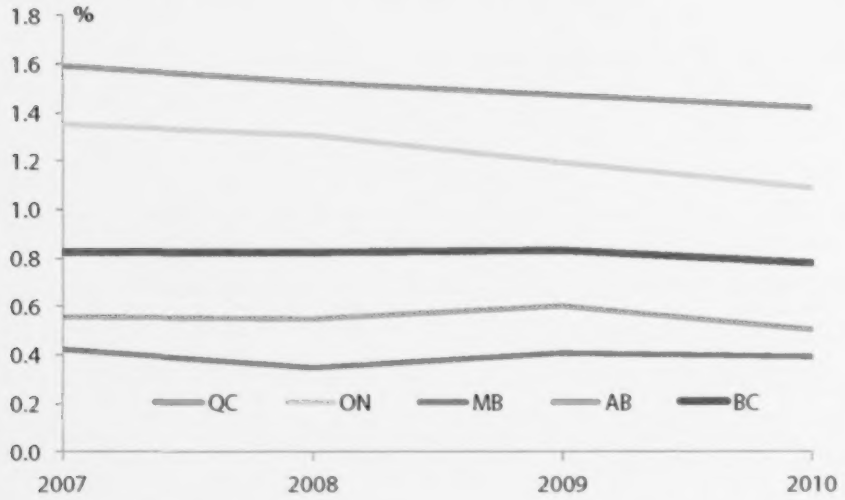
Research and development (R&D) provides the potential for innovation and new discoveries in the form of new products, services or processes that eventually enhance productivity. In this way, R&D is viewed as an investment in future production of the economy. The ratio of R&D performed by business (BERD) to GDP is an indicator of the proportional investment in R&D by the business sector relative to the size of the overall economy. It is assumed that a higher proportion is likely to lead to higher rates of discovery and increased commercialization activity.

Canada's business sector performed $15.1 billion worth of R&D in 2010 (the latest year for which data is available), amounting to about 0.9% of the nation's GDP in that year. In recent history, the ratio of business R&D (BERD) to provincial GDP has been much

higher in Quebec and Ontario than in the rest of the country. Although B.C. (0.8%) was well above Alberta (0.5%) and Manitoba (0.4%) in R&D to provincial GDP in 2010, it was far exceeded by Ontario (1.1%) and Quebec (1.4%). Until the end of the last decade, the ratios of BERD to GDP in B.C. and Alberta were quite comparable. However, in more recent years, R&D has lagged in Alberta, resulting in its falling well behind B.C.

In 2010, Ontario and Quebec made up a combined 76% of business R&D in Canada. At the same time, B.C.'s share was 11%, while 9% was attributable to Alberta, and just 1% to Manitoba.

INDICATOR B-8: RATIO OF BUSINESS PERFORMANCE OF R&D TO GDP



Data source: Statistics Canada

Quebec's ratio of business performance of R&D to GDP remains well above that of the other tech provinces

5. Government Indicators

The government sector affects high technology firms by providing a regulatory, tax, and infrastructure environment for the private sector and by funding and directly performing R&D.

In British Columbia, the tax regime is relatively on par with other provinces. B.C., Alberta and New Brunswick have considerably lower corporate income tax rates than other regions, while Manitoba has the lowest small business tax rate.

Also included in this section is a summary of gross expenditures on R&D (GERD) in British Columbia. This consists of R&D performed by business and higher education in addition to federal and provincial governments.

TABLE 4: QUICK SUMMARY OF INDICATORS FOR THE GOVERNMENT SECTOR

INDICATORS	Trend		Ranking	
	Long-Term	Latest Year	Five High Tech Provs.	Overall
G-1: Personal tax index individual with $80,000 income	↓	↓	1 of 5	1 of 10
G-2: Small business tax rate	→	→	2 of 5	4 of 10
G-3: Corporate income tax rate	↓	→	1 of 5 (tied)	1 of 10 (tied)
G-4: Government expenditure on R&D (GOVERD) to GDP	↓	↓	5 of 5	10 of 10
G-5: Gross expenditure on R&D (GERD) to GDP	→	↓	3 of 5	3 of 10

5.1. Tax Rates: Individual and Corporate

Why are these indicators important?

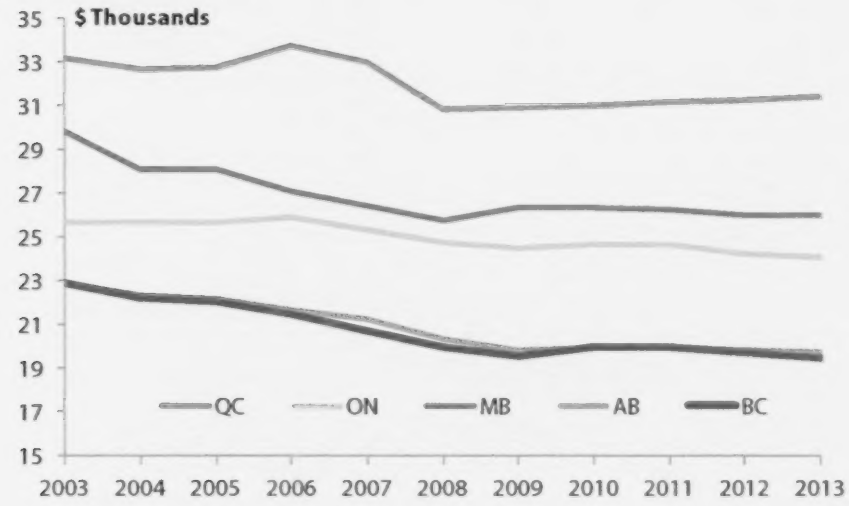
High technology companies are highly mobile because much of the input to their production is derived from human capital. As a result, high technology companies are often free to seek an ideal location to establish operations. Lower levels of taxation are thought to attract investment and encourage a skilled labour pool. On the other hand, desirable amenities that may play an equal role in attracting skilled workers, such as quality of life, social programs, environmental standards and regulated working conditions may result in higher levels of taxation.

One significant policy area over which the government has complete control is tax rates. Lower levels of taxation are thought to attract investment and a skilled workforce—both essential to the high technology sector. Also, a better quality of life associated with regulation of working conditions, environmental standards and universal social programs

are thought to be appealing to high technology workers. Such amenities tend to result in higher levels of taxation.

Over the past decade in British Columbia, taxation levels for single (unattached) individuals earning $80,000 or more a year has showed a steady decline. The province has had the lowest rate for much of the last decade. The total taxes levied to high income earners in the province averaged $19,512 (or 24%) in 2013, the lowest level in the nation. This rate was down 1.2% from 2012 and reflects a considerable decline since 2003, when taxes amounted to $22,892 (29%). The long-term decrease in personal taxes on high-income earners has not been unique to British Columbia; taxation rates have also exhibited a downward trend in most other provinces. As average taxes paid by high-income earners in B.C. continue to fall, the province's rates remain well below those in Quebec ($31,455), Manitoba ($26,027) and Ontario ($24,125). On the other hand, taxes paid in neighbouring Alberta (which inched down -0.3% to $19,777 between 2012 and 2013) remain close to those paid in British Columbia.

INDICATOR G-1: AVERAGE OF ALL TAXES PAID BY UNATTACHED INDIVIDUALS EARNING $80,000 PER YEAR ($ '000)



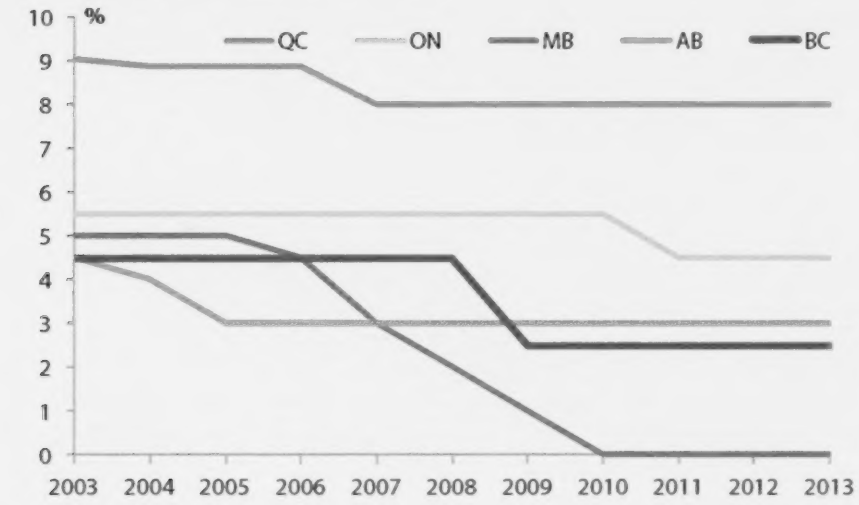
Data source: B.C. Ministry of Finance

B.C. and Alberta have historically had nearly identical taxation levels for high-income earners

In 2009, B.C.'s small business tax rate declined, giving the province the second lowest small business tax rate (2.5%) of the high technology provinces. In 2008, Manitoba lowered its small business rate to below that of Alberta and continued to drop, succeeding in eliminating the tax altogether in 2010. Consequently, 2013 marked the fifth consecutive year that Manitoba has had the lowest small business tax rate (0.0%) in the country. Meanwhile, Alberta's rate has held at 3.0% since 2005. Quebec's tax rate

jumped over three percentage points in 1999 and since then has hovered around eight to nine percent (8.0% in 2013). Ontario's rate has remained unchanged since 2011 (4.5%) and B.C.'s small business tax rate has rested at 2.5% for five consecutive years.

INDICATOR G-2: SMALL BUSINESS TAX RATE

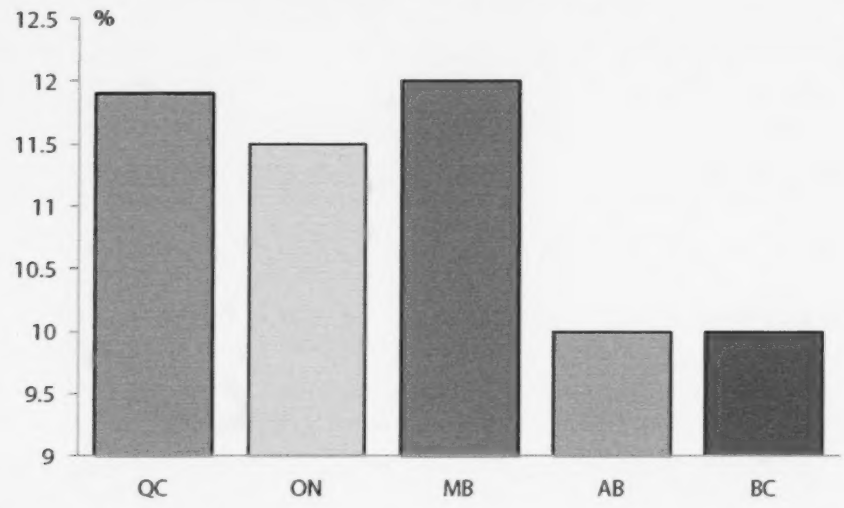


Data source: B.C. Ministry of Finance

B.C.'s small business tax rate is the second lowest of the high tech provinces

British Columbia's general corporate income tax rate is also lower than in most other provinces. In 2013, B.C's and Alberta's corporate tax rates, each at 10.0%, were tied for the lowest among the high tech provinces for the third consecutive year. Prior to 2008, Quebec had boasted the lowest rate, but, in 2008, it raised its rate from 9.9% to 11.4% and bumped it up again in 2010. In 2013, Manitoba's rate (12.0%) sat just above that of Quebec (11.9%) and Ontario (11.5%).

INDICATOR G-3: GENERAL CORPORATE INCOME TAX RATE IN 2013



Data source: B.C. Ministry of Finance

B.C. and Alberta have the lowest corporate tax rates in the country

5.2. Performance of R&D by the Government Sector

Why is this indicator important?

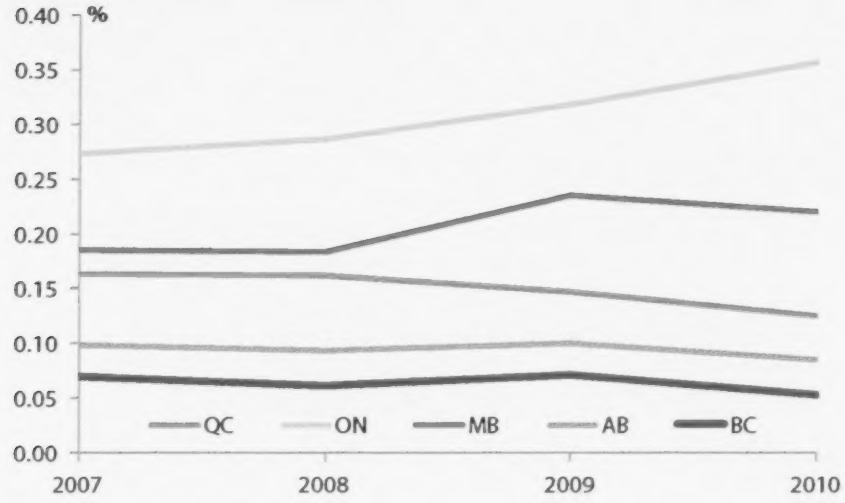
Government tends to fund much more R&D than it actually performs. However, in some fields, governments do maintain research personnel in order to provide independent testing of products, processes and practices. The purpose of most internal government research is not necessarily focused on innovation, but serves a review function. Significant innovations developed by government researchers are often spun-off to the private sector. The ratio of government R&D to GDP is an indicator of the proportional investment in R&D by the government sector relative to the size of the overall economy.

The combined federal and provincial government sector in Canada performed $3.4 billion worth of R&D in 2010 (the latest year for which data is available), up substantially (+7.0%) from 2009. This marked the highest level on record and accounted for 0.20% of Canada's GDP in that year.

Among the high technology provinces, Ontario has historically maintained by far the highest ratio of government R&D to GDP. With a ratio of 0.36% in 2010, Ontario held its position, while Manitoba (0.22%) remained second for the fourth consecutive year. B.C. has consistently ranked last compared to all Canadian provinces, while Alberta has

held the eighth place. In 2010, Alberta's ratio (0.08%) decreased slightly from 2009 (0.10%), and B.C.'s also crept down 0.02 percentage points to 0.05%.

INDICATOR G-4: RATIO OF COMBINED FEDERAL AND PROVINCIAL PERFORMANCE OF R&D TO GDP



Data source: Statistics Canada

Ontario has had the highest ratio of government R&D to GDP for at least two decades

5.3. Gross Expenditure on R&D

Why is this indicator important?

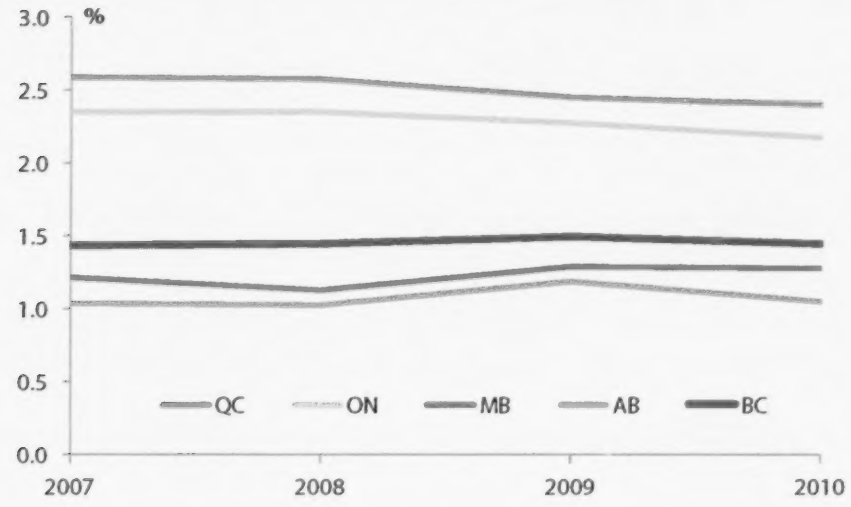
The overall ratio of total R&D effort to the overall economy, also known as the GERD ratio, is a measure of how much a jurisdiction is willing to sacrifice current consumption for potential increased future capacity. The changing structure of the ratio (the relative size of the component investments by the government, business and higher education sectors) over time is a measure of the shifting importance different sectors place on the performance of R&D.

Gross Canadian expenditure on research and development (GERD) exceeded $30.0 billion in 2010, a 1.3% jump over the previous year. This amounted to 1.8% of Canada's GDP in that year.

The GERD to GDP ratios for Quebec and Ontario have been very close over the last decade and 2010 was no exception to this pattern. Between 2009 and 2010, Ontario's rate slipped from 2.3% to 2.2%, while Quebec's decreased from 2.5% to 2.4%. In 2010, Manitoba's ratio was at 1.3%, while B.C.'s was somewhat higher (1.5%). At 1.1%, Alberta's rate remained the lowest of the high tech provinces.

The largest single performer of R&D in B.C. is the business sector. Business performed 53% of R&D in the province in 2010, while higher education comprised a comparable portion (43%). Together, the federal and provincial government performed just four percent of B.C.'s R&D effort. This is also a common trend among other high tech provinces. In Alberta, the business sector accounted for 48% of performed R&D and higher education made up 44%. However, government performed a much higher share of research in that province (8%) than in British Columbia. Meanwhile, Manitoba recorded by far the largest share of R&D attributable to higher education (52%) and government (17%), but substantially less was performed by the business sector (31%) than in the other high tech provinces. The business sector performed most of the R&D in both Quebec (59%) and Ontario (50%) in 2010.

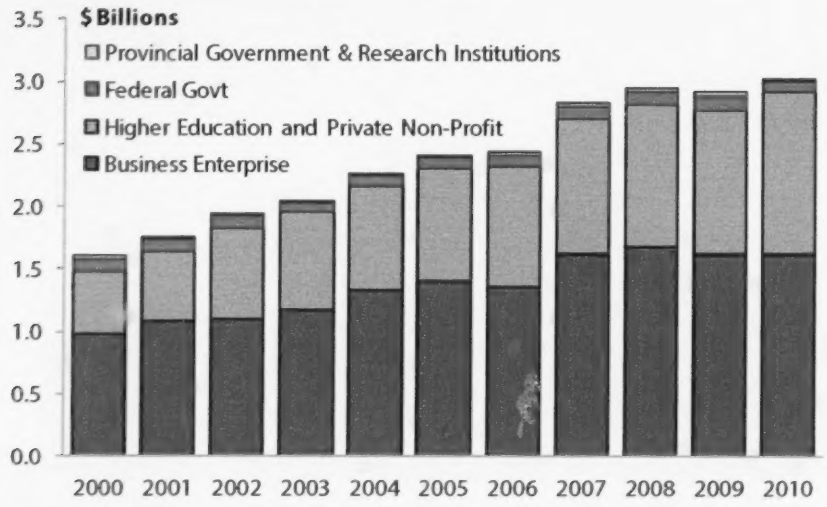
INDICATOR G-5: RATIO OF TOTAL EXPENDITURE ON R&D TO GDP



Data source: Statistics Canada

B.C.'s ratio of total expenditure on R&D to GDP has remained relatively unchanged in recent years

SHARE OF R&D PERFORMANCE IN B.C., BY SECTOR



Data source: Statistics Canada

The business sector is consistently the leading performer of R&D in B.C.

6. External Indicators

The economy in British Columbia is highly dependent on trade with other provinces and foreign countries, both as a source of goods and services used in the province and as markets for its products. As they do in the economy as a whole, trade relationships play an integral role in the high tech sector. Since imported components are often used to produce high tech products, imports of high technology goods can be an indicator of future production. B.C.'s high tech imports have been volatile over the past decade and are impacted by currency exchange rates and the health of the overall economic climate.

Along with the nation as a whole, British Columbia also benefits from a large number of well-trained and educated immigrants. Migration from other Canadian provinces is also a substantive source of educated and trained workers to B.C.

TABLE 5: QUICK SUMMARY OF INDICATORS FOR THE EXTERNAL SECTOR

INDICATORS	Trend		Ranking	
	Long-Term	Latest Year	Five High Tech Provs.	Overall
X-1: Percentage of immigrants with 16+ years of education	→	↓	3 of 5	5 of 10
X-2: Median years of schooling of immigrants	↓	↓	3 of 5	5 of 10
X-3: Net inter-provincial migration	↓	↓	3 of 5	8 of 10
X-4: High technology imports	↑	↑	n/a	n/a

6.1. Educational Background of Immigrants

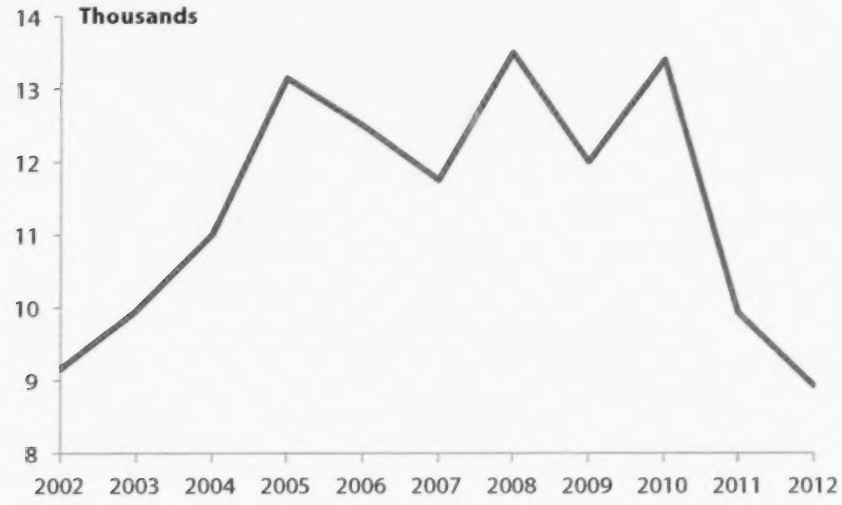
Why are these indicators important?

The economic effects of immigration depend on the skills and resources immigrants bring with them. Two specific indicators of the educational attainment of immigrants are the percentage of immigrants aged 25 years and older with 16 or more years of education (sufficient levels to obtain a university degree in Canada) and the median years of education of immigrants aged 25 years and older at landing. An influx of highly educated immigrants increases the supply of skilled labour and can provide a significant boost to high technology companies. Immigrants also offset the loss of skilled workers who move to other provinces or out of Canada.

Over the past several years, British Columbia has experienced high levels of immigration, and in 2012, this trend continued.[20] As in other parts of the country, immigrants to the province tend to be well educated.

B.C. has certainly been a central destination for skilled immigrants. Over the past decade, (from 2002 to 2012), the province received over 125,000 immigrants with 16 or more years of education—more than any other province except Quebec and Ontario. One reason for B.C.'s success in attracting these immigrants is that Asia has become the top origin for immigrants to Canada and British Columbia's relative proximity to Asia compared to the rest of Canada makes it a prime destination.

INDICATOR X-1: ADULT IMMIGRANTS TO B.C. WITH 16 OR MORE YEARS OF SCHOOLING AT TIME OF LANDING



The number of immigrants to B.C. with 16 or more years of schooling has decreased recently

Data source: Citizenship and Immigration Canada

The number of immigrants to Canada with 16 years or more of education has dropped off in most provinces after climbing to a peak in 2010. British Columbia was no exception, as 33.4% fewer immigrants in this category immigrated to the province in 2012 compared to 2010.

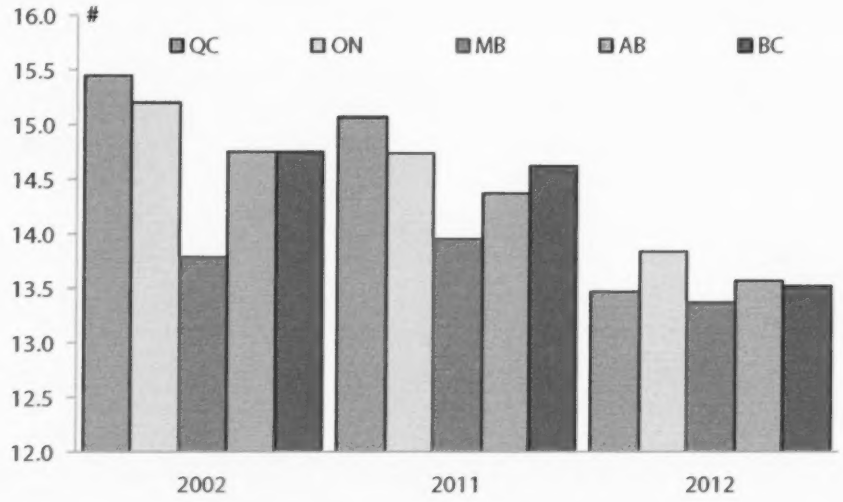
In 2012, the median education level of adult immigrants (aged 25 years and older at landing) to B.C. was 13.5 years of schooling, slightly under that of top-ranking Ontario (13.8), but relatively on par with that of the other high tech provinces.

The median years of schooling of immigrants aged 25 years and older has increased notably since the 1990s, but appears to have reached a plateau in recent years and has

[20] For detailed immigration data, see the BC Stats website: http://www.bcstats.gov.bc.ca.

even begun to decline in some provinces. Between 2002 and 2012, median education was down from 14.8 years to 13.5 years in British Columbia. Other provinces have seen a similar trend: the Canadian median slipped from 15.1 years of education to 13.6 years over the same period. Most of the decline occurred between 2011 and 2012. For B.C., the median years of schooling fell from 14.4 in 2011 to 13.5 in 2012.

INDICATOR X-2: MEDIAN YEARS OF SCHOOLING AMONG IMMIGRANTS AGED 25 YEARS AND OLDER



Data source: Citizenship and Immigration Canada

Immigrants to Ontario have the highest median number of years of schooling

6.2. Inter-provincial Migration

Why is this indicator important?

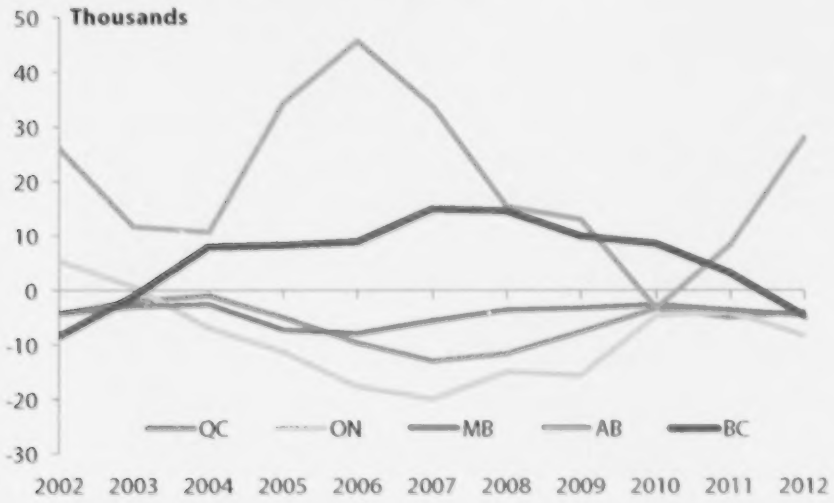
Canadian workers are much freer to move within the borders of the country than they are internationally. In aggregate, population movement between provinces is a general indicator of perceived economic opportunity and general attractiveness. Individuals and families often relocate for economic reasons. In this way, this indicator points to the overall perception of the strength of provincial economies and the labour pool from which employers can draw.

The pattern of inter-provincial migration in Canada is substantially dictated by people seeking better economic opportunities. It used to be the case that the migration patterns of B.C. and Alberta mirrored each other. However, in recent years, net migration levels for B.C. and Ontario have shown a stronger correlation. Following a lengthy period of outflow to other provinces in the late 1990s and early 2000s, the province saw a substantial turnaround over the past decade. In 2003, out-migration from B.C. began to

ease and, in 2011, the province marked the eighth consecutive year of net inter-provincial gains. However, this trend came to a halt in 2012, when the province saw a net loss of over 4,600 people to other provinces. B.C. was not the only province to see a decline in 2012.[23] In fact, Alberta and Saskatchewan were the only provinces to receive a net influx of residents from other parts of the country.

Between 2002 and 2012, Alberta and B.C. were the only two provinces to experience an annual net in-migration. Alberta saw an annual average of more than 20,400 people over the ten-year period, while B.C. gained an average of almost 5,700 residents from other provinces per year. On the other side of the country, Ontario experienced an average annual net out-migration to other provinces of about 8,800 people, while Manitoba saw an average annual loss of more than 4,300. Quebec has seen consistent net interprovincial out-migration for at least the past 20 years, losing an average of over 5,900 people annually between 2002 and 2012.

INDICATOR X-3: NET INTER-PROVINCIAL MIGRATION



Inter-provincial migration to B.C. has somewhat mirrored that of Ontario over the past decade

Data source: Statistics Canada

[23] Dates for this indicator are in Census years, such that '2012' refers to the July 1st, 2011 to June 30th, 2012 period.

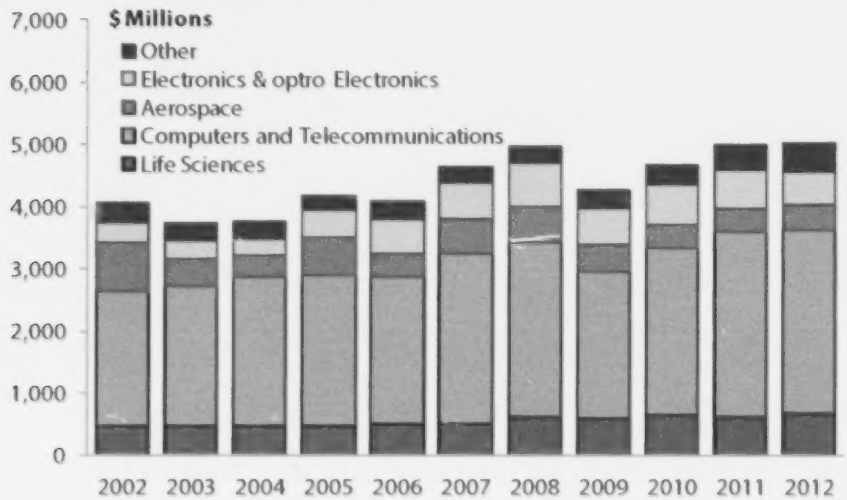
6.3. High Technology Imports

Why is this indicator important?

Although a heavy reliance on imports can create a negative trade balance (the difference between the value of goods exported and the value imported), imports of high technology goods are often essential to supply domestic supply chains that turn imports into future exports. For instance, without state-of-the-art telecommunications, the high technology sector as a whole would struggle. Similarly, purchases of computer integrated manufacturing technology would displace future imports of other goods, whether high technology or low technology, and could generate goods for export. More importantly, high technology imports are a key driver in productivity growth and enhancing competitiveness. Although some tech imports are consumer goods, such as smart phones, laptops, etc. for personal/household use, a significant portion is comprised of goods and services utilized by businesses operating in the high tech sector.

Imports of high technology goods are crucial to the success of B.C.'s high technology sector.[22] Imports of such goods rose steadily in the 1990s, but began to slip in 2002 and 2003, when the entire sector went through a slump, and again in 2009, reflecting the effects of the global economic downturn. However, since then imports have bounced back and, in 2012, reached a high of $5.0 billion.

INDICATOR X-4: VALUE OF HIGH TECHNOLOGY IMPORTS TO B.C. ($ MILLION)



Data source BC Stats

Computers and telecommunications make up most of high technology imports to B.C.

[22] Note that imports have not been adjusted for inflation or exchange rate effects.

Computers and telecommunications are the main component (59%) of high technology imports. Life sciences (13%) and aerospace (8%) also make up notable shares.[23]

7. Labour Indicators

Unlike most of the other indicators in this report, which are grouped according to the sector that provides or affects the input, contained in the following section is a set of indicators that are specific to the labour market but that represent a combined impact of the source sectors. In the case of labour input, indicators such as the unemployment rate are not attributable to a single source sector.

Nation-wide, rates of unemployment among workers in the natural and applied sciences are consistently well below those for the economy as a whole. Unemployment rates in this sector have been falling quite consistently since the early 1990s. The past decade has witnessed both the highs and lows of unemployment rates in B.C., from the labour shortage crisis of 2006-2008 to the economic slowdown that began in late 2008.

TABLE 6: QUICK SUMMARY OF INDICATORS FOR LABOUR

INDICATORS	Trend		Ranking	
	Long-Term	Latest Year	Five High Tech Provs.	Overall
L-1: Unemployment rate for natural and applied sciences	→	↑	5 of 5	6 of 10
L-2: Research personnel per 100,000 population	↑	↓	3 of 5	3 of 10
L-3: Quality of life, Vancouver∞	↓	→	n/a	5 of 221
L-4: Cost of living×		↑	n/a	5 of 6

∞ The ranking compares Vancouver to 221 cities worldwide.
× The ranking compares Vancouver to five other Canadian cities.

[23] For a description of what these commodity groups contain, see Appendix B of the *Profile of the British Columbia High Technology Sector*.

7.1. Unemployment Rate in Natural and Applied Sciences

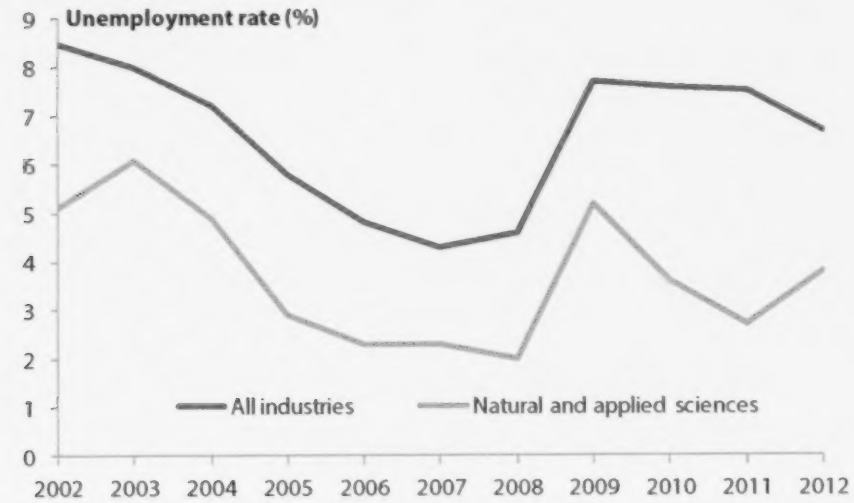
Why is this indicator important?

A low level of unemployment in natural and applied science occupations is desirable because some components of this group (e.g., computer scientists) are the engines of innovation in the high technology economy. Higher levels of unemployment in this group indicate idle intellectual capital, which has the effect of slowing the overall rate of innovation. Also, a lower ratio between the unemployment rate for natural and applied science occupations and the overall labour force indicates heightened demand for these specializations. This should attract high tech workers from other jurisdictions as well as more students into these areas. However, it should be noted that a low rate of unemployment may not always be seen as a positive, particularly from a labour-supply perspective. Given tight labour conditions, prospective employers may see appeal in a higher rate of unemployment in that it implies the existence of a larger labour pool from which to select employees.

Between 2002 and 2012, British Columbia's highest annual rate of unemployment for all occupations occurred in 2002, at 8.5%. Over the same period, the highest recorded overall unemployment rate for the nation as a whole was 8.3% in 2009. In contrast, the highest rate of unemployment for natural and applied sciences in the province was 6.1% in 2003 and 4.6% for Canada in 2009. Clearly, at least over the past decade, persons in the natural and applied sciences occupations have enjoyed an employment advantage compared to the labour force as a whole.

In 2012, the unemployment rate for natural and applied sciences in British Columbia was 3.8%, up from 2011 (2.7%) and a half point above the national average (3.3%). In that year, all of the high tech provinces saw an increase in unemployment rates in natural and applied sciences, though not to the same extent as British Columbia. B.C.'s rate remained above that of other tech provinces, most notably Manitoba (2.4%) and Alberta (2.5%). Although higher than the previous year, this is a marked improvement from just a few years prior, when B.C. also had the highest high tech unemployment rate among the five high tech provinces (5.2% in 2009).

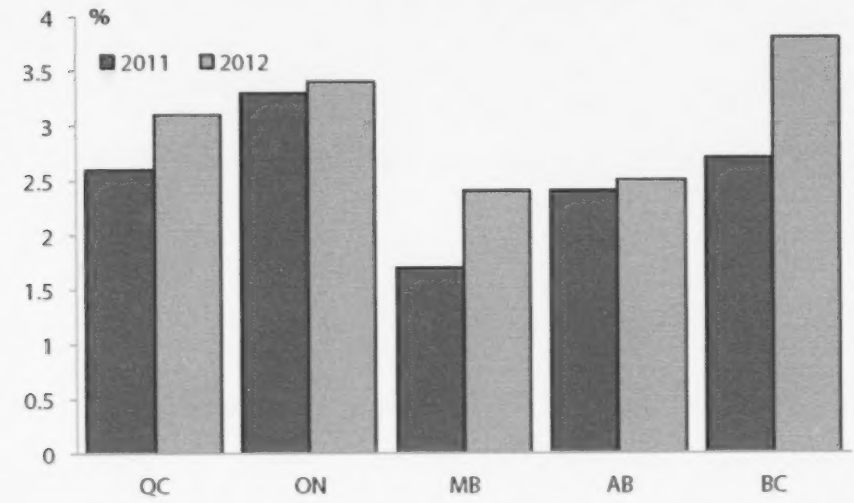
INDICATOR L-1: B.C. UNEMPLOYMENT RATE FOR NATURAL AND APPLIED SCIENCE OCCUPATIONS (%)



Jobless rates for natural and applied sciences climbed in 2012

Data source: Statistics Canada

UNEMPLOYMENT RATE FOR NATURAL AND APPLIED SCIENCE, 2011 AND 2012 (%)



In 2012, unemployment rates for natural and applied sciences were up in each of the high tech provinces

Data source: Statistics Canada

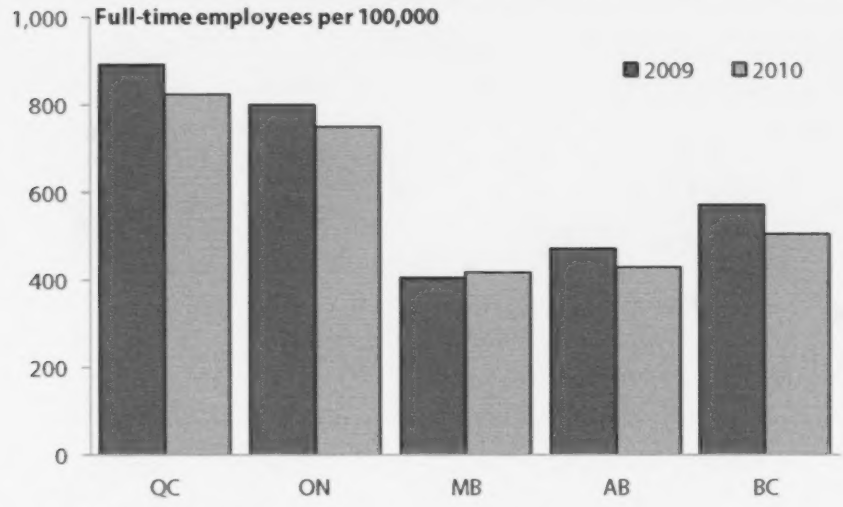
7.2. Research Personnel

Why is this indicator important?

The absolute number of researchers and technicians engaged in research is an important determinant of the volume of scientific and technical discoveries that may result in patent applications, and later, in the birth of new firms or the growth of existing firms. The structure of the research workforce is also important in terms of the employment sector, whether federal government, provincial government, business enterprise or higher education. Each sector has different reasons for developing new technology and different methods of bringing new discoveries to market.

B.C. has historically trailed the overall Canadian average in terms of researchers per 100,000 population. However, in 2003, British Columbia replaced Alberta as the third largest workforce of researchers and technicians per 100,000 persons, and has since held onto its standing. The province was home to 22,800 researchers in 2010, making for a research force of 503 per 100,000 persons. In the same year, Alberta's research force stood at 430 per 100,000 persons. Quebec (824) and Ontario (752), continued to have by far the largest research workforce per 100,000, while Manitoba (416) had the lowest per capita rate among the high tech provinces. Ontario (99,490 workers) maintained the largest research workforce in absolute numbers, followed by Quebec (65,160) and British Columbia.

INDICATOR L-2: TOTAL RESEARCH WORKFORCE PER 100,000 PERSONS, 2009 AND 2010



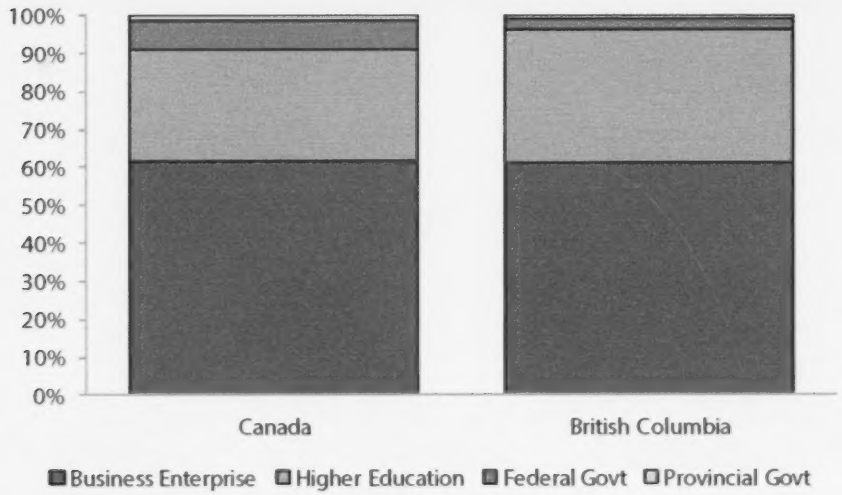
Data source: Statistics Canada

Manitoba was the only tech province to see its research workforce expand in 2010

In 2010, as in previous years, business and higher education claimed the largest shares of Canadian research personnel (62% and 29%, respectively). Business accounted for the largest proportion of the research workforce in most of the high technology provinces. The proportions ranged from just 39% of personnel in Manitoba to over two thirds (70%) in Quebec. Around 61% of B.C's research personnel were from the business sector.

Not surprisingly, due to the concentration of federal agencies in the National Capital Region (Ottawa), Ontario has a larger portion of federal research personnel (11%) than most provinces. However, the share of Manitoba's researchers working in federal government is even greater (14%). Alberta's provincial government research workforce (5%) is almost five times that of the Canadian average (1%). The share of researchers in the higher education sector in B.C. (35%) continued to be above that of Canada as a whole (29%), but remained much lower than for Alberta (42%) and Manitoba (45%).

STRUCTURE OF THE RESEARCH WORKFORCE BY SECTOR IN 2010



Data source: Statistics Canada

Most of B.C.'s research workforce is found in the business sector

7.3. Quality of Life

The indicator explained

Mercer Human Resource Consulting—a large international management firm—developed "quality of life" scales to assist companies in determining hardship pay. Such allowances are often provided when a company sends employees to work in foreign (particularly third world) countries. The Mercer quality of life survey provides rankings based on 39 indicators, grouped into ten categories:

- Political and social environment (political stability, crime, law enforcement, etc.)
- Economic environment (currency exchange regulations, banking services, etc.)
- Socio-cultural environment (censorship, limitations on personal freedom, etc.)
- Medical and health considerations (medical supplies and services, infectious diseases, sewage, waste disposal, air pollution, etc.)
- Schools and education (standard of schools)
- Public services and transportation (electricity, water, public transport, traffic, etc.)
- Recreation (restaurants, theatres, cinemas, sports and leisure, etc.)
- Consumer goods (availability of food, daily consumption items, cars, etc.)
- Housing (housing, household appliances, furniture, maintenance services, etc.)
- Natural environment (climate, record of natural disasters)

British Columbia's largest city is consistently ranked as having the highest overall quality of life in North America and among the highest in the world. Granted, B.C. is made up of many diverse regions, cities and towns, but since Vancouver is the most populous metropolitan area in the province, its high ranking reflects on the province as a whole.[24] Also, most of the quality of life variables are at equally high levels in other parts of the province. The positive ranking for Vancouver holds great potential to provide a substantial competitive advantage in attracting high tech workers.

INDICATOR L-3: QUALITY OF LIFE INDEX RANKING, 2012

	Global Rank	Americas Rank
Vancouver	**5**	**1**
Ottawa	14	2
Toronto	15	3
Montreal	23	4
Honolulu	28	5
San Francisco	29	6
Calgary	32	7
Seattle	44	12

Data source: Mercer Human Resource Consulting

Vancouver ranks first in the Americas on the quality of life scale

[24] The Mercer Human Resource quality of life scales give rankings only to large target urban centres. However, an urban centre's ranking can be quite representative of its surrounding regions.

In 2012, Vancouver's score on the overall quality of life index remains well above cities in the other high tech provinces. On a global scale, Vancouver ranks fifth among the 221 cities included in the study, far higher than Ottawa (14th), Toronto (15th), Montreal (23nd), and Calgary (32th). Key American cities with which B.C. competes for high tech workers and firms (particularly Seattle and San Francisco) also rank lower than Vancouver.

7.4. Cost of Living

The indicator explained:

The inter-city price index compares the cost of consumer goods and services in different parts of the country. The "all items" price index is based on a bundle of goods and services that represents the expenditure patterns of a hypothetical average Canadian household. The largest component of the all items index is shelter. This includes the cost of owned or rented housing and related expenses (insurance, electricity, fuel oil, etc.). Prices recorded are the full consumer price, including sales and excise taxes, and are based on a combined city average (100).

Predictably, the higher quality of life for the province's metropolitan centre comes with a price. In terms of general retail prices, Vancouver is the second most expensive large urban centre in Canada.[75]

With a rate of 105, retail prices in Vancouver were five points higher than the combined city average (100) in October 2011, up from 103 in 2010. This bumped Vancouver's rate above that of Ottawa (102) but it remained below that for Toronto (107). On the other end of the scale, Edmonton (99), Winnipeg (93) and Montreal (93) continued to enjoy lower than average retail prices. Until recently, retail prices in Vancouver appeared to have been declining (compared to the average). Between 2001 and 2009, retail prices went down from six points to just one point above average.

Shelter costs comprise the largest component of the inter-city price index. In 2011, Vancouver's costs for shelter were 13 points above the average, the second highest in Canada. In Toronto, shelter costs were an even more substantial 15 points above average. Shelter costs were well below average in Winnipeg (18 points lower) and Montreal (17 points lower).

[75] Based on an average of the largest cities in each of the ten provinces as well as the nation's capital (11 cities total). Note that the inter-city price index measures only the price differences for a specific basket of goods, which may or may not be representative of the overall cost of living for each specific city.

INDICATOR L-4: RETAIL PRICES BY MAJOR CITY

Note: This index measures only the price differences for a specific basket of goods, which may or may not be representative of the overall cost of living for each specific city.
Data source: Statistics Canada

Retail prices in Vancouver are above those of the average metropolitan city in Canada, but lower than those in Toronto

8. Post-Secondary Outcomes

Data gathered from British Columbia's post-secondary students provides an understanding of the educational and post-academic experiences of former students of high technology-related programs and of former post-secondary students who hold jobs in the high technology industry. This information is useful in determining if the educational programs are meeting the learning needs of those in the high technology sector. These data come from the Diploma, Associate Degree, and Certificate Student Outcomes (DACSO) Survey and from the Baccalaureate Graduates Survey (BGS). These surveys are conducted with funding from the Ministry of Advanced Education and the participating post-secondary institutions.

The DACSO Survey is one of four annual surveys in the BC Student Outcomes project, which collects information from B.C.'s former post-secondary students. The DACSO Survey asks former students from diploma, associate degree, and certificate programs to evaluate their educational experiences and to talk about their employment and further education. It is conducted 9 to 20 months after students leave their program.

The BGS is also part of the BC Student Outcomes project. Since 2000, the BGS has been tracking the outcomes of baccalaureate graduates, both two and five years after

graduation. The BGS gathers information on baccalaureate graduates' education satisfaction levels, financing and student debt, additional studies, and employment outcomes. BGS data used in this report are from the two-year out survey cycle only.

The DACSO and BGS surveys provide information about graduates of high technology programs and their current employment situation. These surveys also identify characteristics of graduates employed in high technology occupations.

Respondents to both surveys were asked about their satisfaction with their education, the quality of instruction, whether they enrolled in further studies after graduation, and their current activities (e.g., studying or working). The survey results also provide insight into the unemployment rates for graduates of high technology programs.

Among those who were employed, the surveys provide information about the characteristics of employment, including whether the job is full-time, if it is related to the training they received and if it involves paid employment (versus self-employment). Average weekly hours worked and average hourly wages (DACSO) or average annual salary (BGS) are also available. Finally, the top occupations among high technology program graduates are provided, as are the programs from which high technology job holders graduated.

Over three-quarters of DACSO respondents were graduates—88% of high technology program respondents and 75% of non-high technology program respondents. All BGS respondents were graduates. Only graduate respondents were included in this report. Sixteen percent of graduate respondents to the DACSO Survey and 18% of BGS graduate respondents were from programs designated as high technology.

Throughout this section of the report, the word *graduates* is used to refer to former students who graduated from their programs and responded to the survey. The percentages presented may not total to 100 or to associated subtotals, due to rounding.

TABLE 7: QUICK SUMMARY OF INDICATORS FOR POST-SECONDARY OUTCOMES

INDICATORS	DACSO Graduates		BGS Graduates	
	High Tech Program	Non-High Tech Program	High Tech Program	Non-High Tech Program
O-1: Satisfaction with education	92%	94%	92%	94%
O-2: Quality of instruction~	94%	95%	92%	95%
O-3: Further studies since graduation	32%	36%	58%	54%
O-4: Current activity:				
Studying	11%	9%	27%	11%
Studying and working	15%	19%	18%	22%
Working	65%	60%	49%	61%
Neither studying nor working	9%	11%	7%	7%
O-5: In the labour force	89%	90%	79%	91%
O-6: Employment rates	80%	80%	70%	84%
O-7: Unemployment rates	9%	10%	11%	6%
O-8: Job related to training^	81%	74%	70%	73%
O-9: Knowledge, skills & abilities useful in job^	85%	82%	80%	85%
	DACSO Graduates		BGS Graduates	
	Employed in High Tech Occupations	Not Employed in High Tech Occupations	Employed in High Tech Occupations	Not Employed in High Tech Occupations
O-11: Training related to job^	92%	75%	86%	72%
O-12: Paid worker^!	95%	95%	95%	95%
O-13: Full-time employment^	84%	74%	95%	82%
O-14: Median income (hourly for DACSO, annual for BGS)	$24	$19	$55,000	$44,000

~ On the DACSO Survey, quality of instruction was asked using a 5-point scale: very good, good, adequate, poor, and very poor. Percentages presented for DACSO quality of instruction include very good, good, and adequate. On the BGS Survey, quality of instruction was asked using a 4-point scale: very good, good, poor, and very poor. Percentages presented for BGS quality of instruction include very good and good.

^ Of those respondents who indicated they were employed.

! In the DACSO Survey, respondents were asked if they were paid workers or self-employed. In the BGS Survey, respondents were asked if they were paid workers, self-employed, or both a paid worker and self-employed. Percentages presented for the BGS Survey represent the percentage of respondents who indicated they were solely a paid worker and those who indicated they were both a paid worker and self-employed.

Note that data from the DACSO and BGS surveys are for British Columbia only and, therefore, provincial comparisons are not available. Due to small numbers, three years of data had to be combined in order to be able to have reportable figures. As a result, time series comparisons are not possible either. Indicator O-10 is not amenable to a quick summary presentation and, therefore, is excluded here.

8.1. Education Evaluation

The indicators explained:

An education in a high technology program area—such as Physical and Life Sciences; Computer and Information Sciences; Engineering and Related Technologies; and Health and Clinical Sciences—provides a skilled workforce ready for employment in high technology occupations. Satisfaction with studies and high quality instruction are indicative of programs that prepare graduates well for work in these fields.

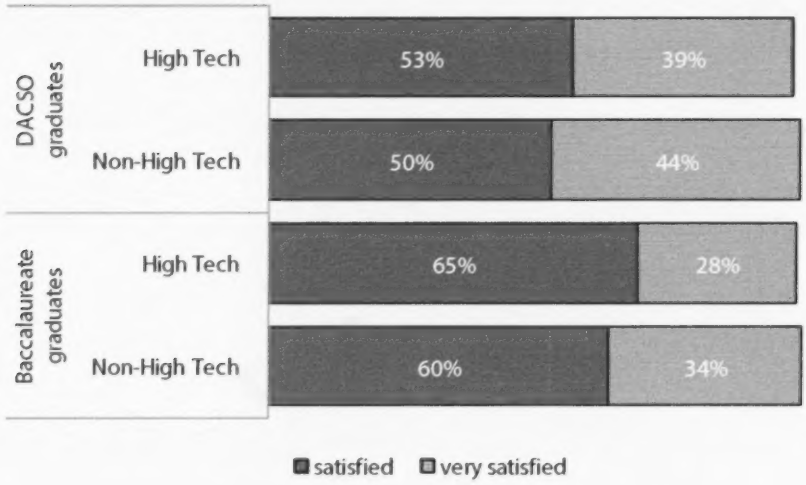
A number of the post-secondary educational programs delivered in B.C. can be considered "high technology". They include Engineering Technologies/Technicians; Biological and Physical Sciences; Computer and Information Sciences and Support Services; and Health Professions and Related Clinical Sciences.

The programs taken by DACSO respondents have been grouped into four program areas: Physical and Life Sciences; Computer and Information Sciences; Engineering and Related Technologies; and Health and Clinical Sciences. The BGS Survey included program graduates from Physical and Life Sciences, Computer and Information Sciences, and Engineering and Related Technologies.[26]

Graduates of post-secondary programs are regularly asked how satisfied they are with the education they received. High technology program graduates reported high levels of satisfaction with their education—92% of DACSO graduates and 92% of baccalaureate graduates said they were *very satisfied* or *satisfied* with their education. These levels were comparable to those for graduates of non-high technology programs.

[26] Additional information about the programs grouped within these high technology programs can be found in Appendix III.

INDICATOR O-1: SATISFACTION WITH EDUCATION

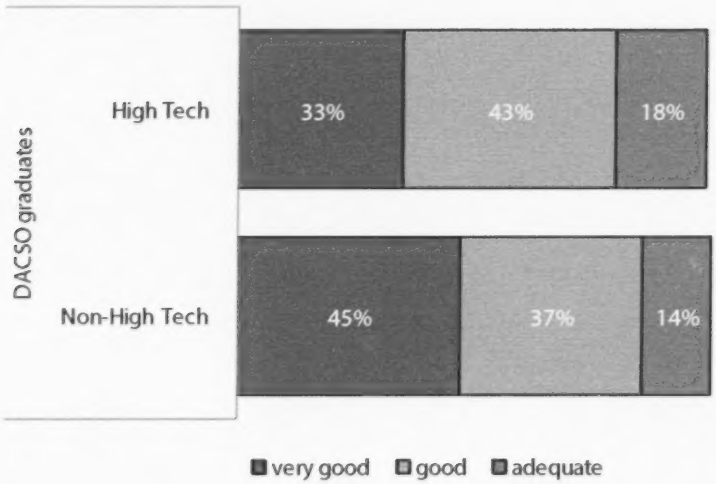


Most DACSO and BGS graduates were satisfied with their education

Data source: BC Student Outcomes, DACSO Survey and Baccalaureate Graduates Survey

Graduates of post-secondary programs also tended to give flattering reviews of their course instruction. Most (94%) high technology DACSO graduates said that the quality of the instruction they received was adequate or better. A similar percentage (95%) of DACSO graduates from other programs reported adequate or better quality of instruction.

INDICATOR O-2 (A): QUALITY OF INSTRUCTION AMONG DACSO GRADUATES

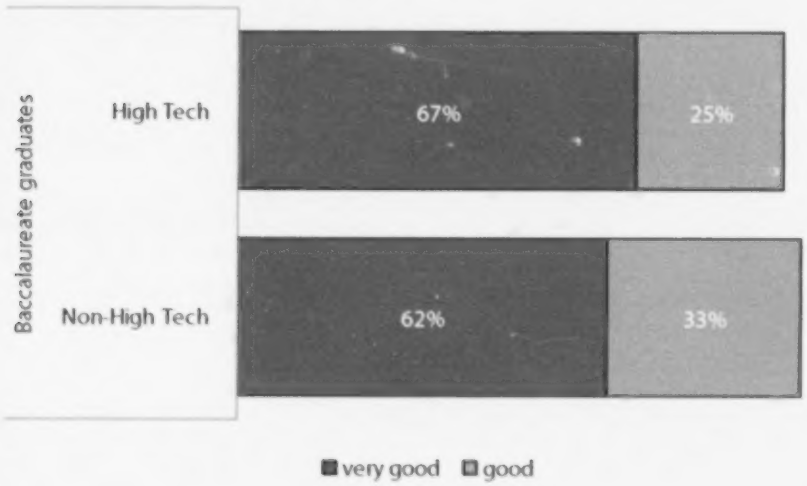


Most DACSO graduates were happy with the quality of their instruction

Note: On the DACSO Survey, quality of instruction was asked using a 5-point scale: very good, good, adequate, poor, and very poor. Percentages presented for DACSO quality of instruction include very good, good, and adequate.
Data source: BC Student Outcomes, DACSO Survey

Among high technology baccalaureate program graduates, 92% reported that the quality of their instruction was good or better. This was slightly lower than the percentage of non-high technology graduates who gave high ratings to the quality of their instruction (95%).

INDICATOR O-2 (B): QUALITY OF INSTRUCTION AMONG BGS GRADUATES



Most BGS graduates thought the quality of their instruction was good

Note: On the BGS Survey, quality of instruction was asked using a 4 point scale: very good, good, poor, and very poor. Percentages presented for BGS quality of instruction include very good and good.
Data source: BC Student Outcomes, Baccalaureate Graduates Survey

8.2. Study and Work Activities

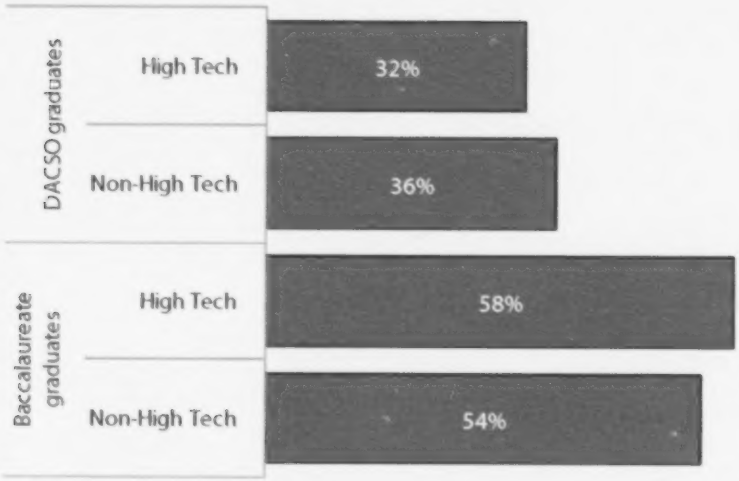
The indicators explained:

Readiness to join the workforce is suggested by a high proportion of former students who are working following their education, while continuing studies indicates additional education is needed or desirable.

Further education is often pursued by graduates of post-secondary programs, which suggests that education over and above what is achieved during these programs is of value when they seek employment.

Almost one-third (32%) of DACSO graduates and more than half (58%) of baccalaureate graduates from high technology programs had taken further studies since graduation. Further studies were more common among DACSO graduates from other programs and less common among BGS graduates from other programs.

INDICATOR O-3: FURTHER EDUCATION



A significant proportion of both DACSO and BGS graduates pursued further education

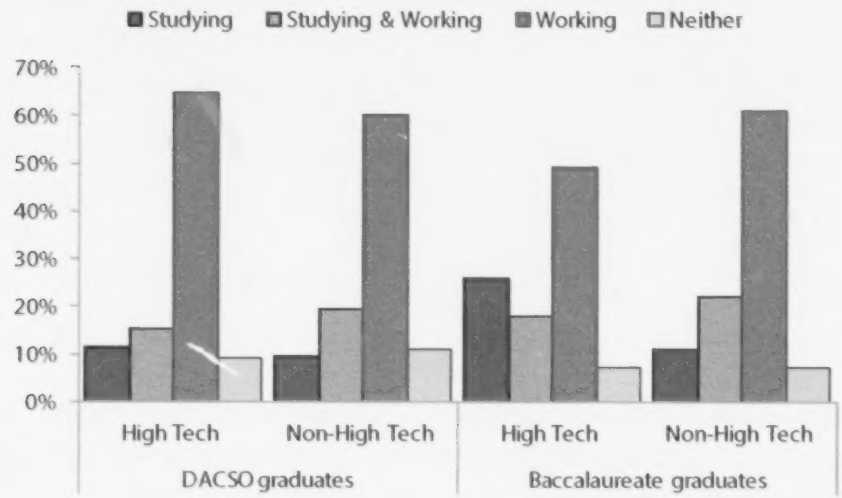
Data source: BC Student Outcomes, DACSO Survey and Baccalaureate Graduates Survey

DACSO and BGS respondents were asked a series of questions to determine their current activities—whether they were currently studying, working, working *and* studying, or neither working nor studying. While post-secondary graduates were predominantly working after graduation, a notable proportion were studying or both studying and working.

Graduates from high technology programs tended to be working at the time of the survey—65% of DACSO graduates and 49% of BGS graduates were solely working. More than 1 out of 4 (26%) DACSO graduates of high technology programs and more than 4 out of 10 (44%) BGS graduates were studying, or studying and working at the time they were surveyed.

Among DACSO graduates, the pattern of current activities was similar for graduates of both high technology and non-high technology programs. For baccalaureate graduates, though, the distribution looked different depending on whether former students graduated from high technology or non-high technology programs. The current activities of high technology baccalaureate graduates were more likely to include studies and less likely to involve work.

INDICATOR O-4: CURRENT ACTIVITY AT THE TIME OF THE SURVEY



Most DACSO and BGS graduates were working at the time they were surveyed

Data source: BC Student Outcomes, DACSO Survey and Baccalaureate Graduates Survey

8.3. Labour Force Outcomes

The indicators explained:

Participation in the labour force and high employment rates indicate positive employability among high technology program graduates. Unemployment, however, does not necessarily indicate that graduates are not employable. Rather, it may be that the job market favours those with additional training or experience. High proportions of post-secondary graduates working in training-related jobs are indicative of a strong high technology workforce. Receiving the right training is vital and this is corroborated by a majority of graduates reporting that the training they received is useful in the performance of their jobs.

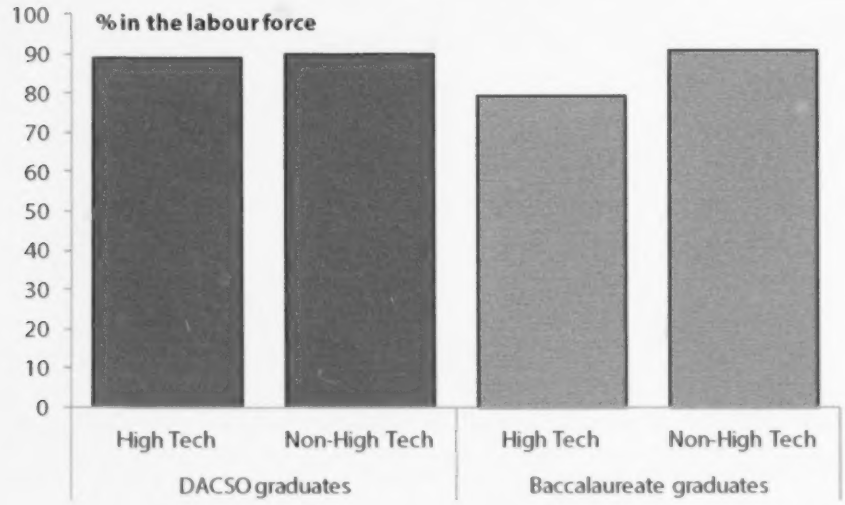
A large majority of post-secondary program graduates were in the labour force; however, many pursued further education instead. This was particularly the case for graduates with baccalaureates.

About 9 out of 10 DACSO graduates were in the labour force at the time of the survey—89% of high technology graduates and 90% of non-high technology program graduates.

Among baccalaureate graduates, 79% of high technology graduates and 91% of non-high technology graduates were in the labour force at the time they were surveyed. This

difference is likely due to the fact that 26% of BGS high technology graduates were engaged solely in studies at the time of the survey, while only 11% non-high technology gradates were exclusively dedicated to studying (note that some may be looking for work and would therefore be considered in the labour force).

INDICATOR O-5: IN THE LABOUR FORCE POST-GRADUATION



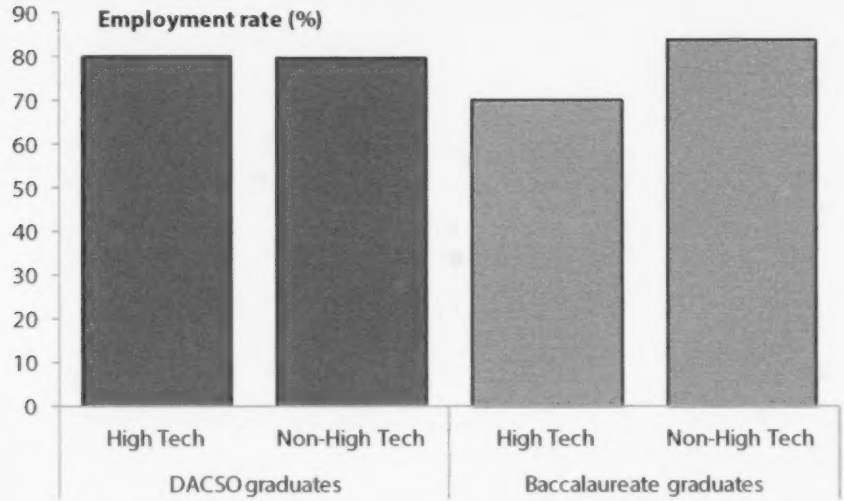
Fewer BGS high technology graduates were in the labour force compared to their non-high tech counterparts

Data source: BC Student Outcomes, DACSO Survey and Baccalaureate Graduates Survey

At the time they were surveyed, the employment rate for DACSO graduates—both those from high technology programs and those from other programs—was 80%.

For high technology baccalaureate graduates, the employment rate was 70%. The employment rate among baccalaureate graduates from other programs was 14 percentage points higher (84%). This difference may also be due to the group of high technology graduates who are exclusively studying.

INDICATOR O-6: EMPLOYMENT RATES POST-GRADUATION



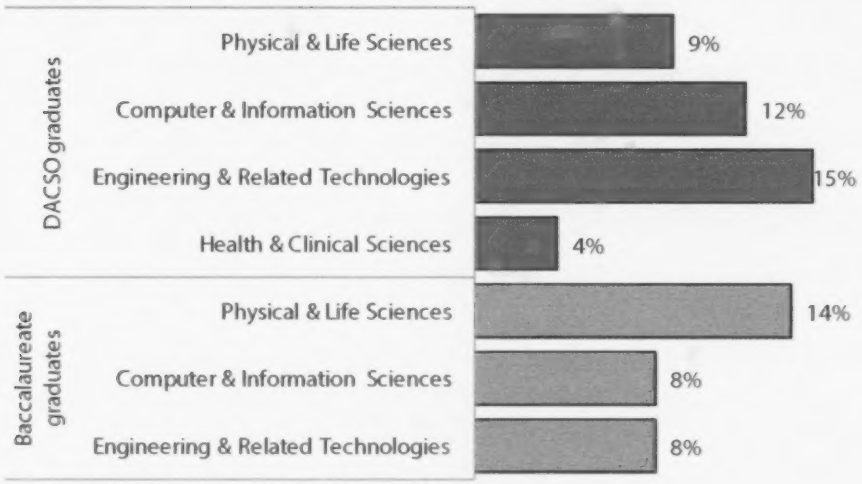
Employment rates were lower among high tech BGS graduates than those of non-high tech BGS graduates

Data source: BC Student Outcomes, DACSO Survey and Baccalaureate Graduates Survey

The unemployment rate for DACSO high technology program graduates was 9%, and the unemployment rate for DACSO graduates from other programs was 10%. Among the four high technology programs surveyed, the unemployment rates varied. Fifteen percent of Engineering and Related Technologies graduates and 12% of Computer and Information Sciences graduates in the labour force were unemployed, compared to just 4% of Health and Clinical Sciences graduates and 9% of Physical and Life Sciences graduates in the labour force.

At the time of the survey, the unemployment rate for high technology baccalaureate graduates was 11%, compared to 8% for baccalaureate graduates from other programs. Unemployment rates were also not equal among the three high technology programs surveyed by the BGS. The unemployment rate for Physical and Life Sciences graduates was 14%, but 8% for both Computer and Information Sciences and Engineering and Industrial Trades.

INDICATOR O-7: HIGH TECHNOLOGY GRADUATES: UNEMPLOYMENT RATES POST-GRADUATION



Unemployment rates among graduates differed depending on their field of study

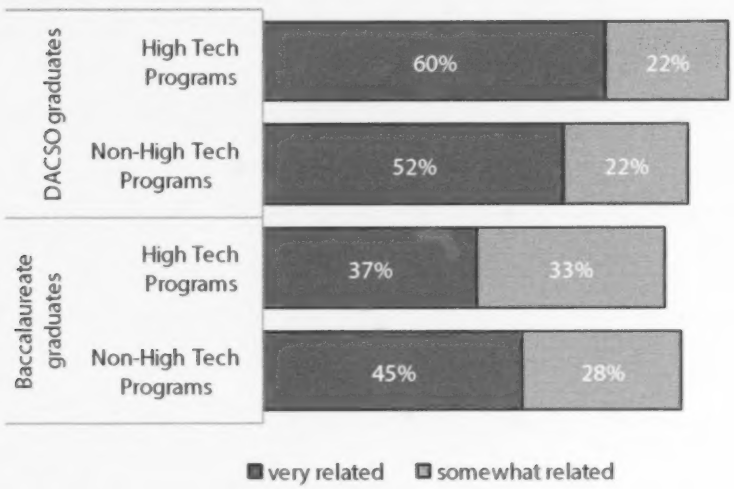
Data source: BC Student Outcomes, DACSO Survey and Baccalaureate Graduates Survey

Most graduates were working in jobs that were related to their training, which suggests that, at the time of the surveys, there was a market for their skills. Overall, three-quarters of DACSO graduates were employed in jobs related to their training with 81% of high technology program graduates and 74% of graduates from other programs employed in training-related jobs. Among baccalaureate graduates, about 7 out of 10 were employed in jobs related to their training with 70% of those from high technology programs and 73% of those from other programs in training-related positions.

For those who were not working in jobs related to their training, it is not clear why there was a lack of correspondence between their jobs and their education. It could be that the market was insufficient, or it could have been a choice made by those graduates.

INDICATOR O-8: JOB RELATED TO TRAINING

Most graduates of high tech programs were working in high tech jobs

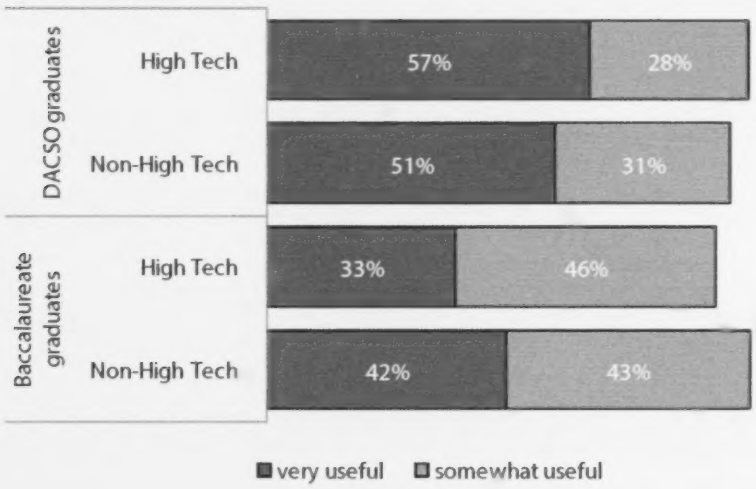


Note: Results presented are for employed graduates only.
Data source: BC Student Outcomes, DACSO Survey and Baccalaureate Graduates Survey

Most graduates, regardless of the job they held, said that what they learned during their education was useful in the performance of their job. This suggests that their education had a broad-based utility in the labour market.

More than 8 out of 10 DACSO graduates said that the knowledge, skills, and abilities they gained during their education were useful in the performance of their job. Around 85% of high technology graduates and 82% of graduates from other programs reported that their education was useful in the performance of their job. Baccalaureate graduates who had completed high technology programs were less likely than non-high technology graduates to say that their education was useful in the performance of their job—79% versus 85%.

INDICATOR O-9: KNOWLEDGE, SKILLS, AND ABILITIES GAINED DURING EDUCATION USEFUL IN PERFORMANCE OF JOB



Most graduates found their education useful in the performance of their job

Note: Results presented are for employed graduates only.
Data source: BC Student Outcomes, DACSO Survey and Baccalaureate Graduates Survey

8.4. Occupations Held by Graduates of High Technology Programs

The indicators explained:

High technology occupations held by graduates of high technology programs demonstrate an alignment between education and employment opportunities.

The National Occupational Classification (NOC) provides a standardized language for describing the work performed by Canadians in the labour market. It gives statisticians, labour market analysts, career counselors, employers, and individual job seekers a consistent way to collect data and describe and understand the nature of work.[27] NOC coding was applied to the data provided by respondents and then the occupations were classified into one of four skill levels that correspond to the training or education (kind and/or amount) required for going into an occupation. Though not separated in the NOC skill levels, management occupations have been split in the following analysis for descriptive purposes.

[27] From the Employment and Social Development Canada *National Occupational Classification* website (April 30, 2013; Retrieved October 4, 2013). More information about the NOC can be found at: http://www.hrsdc.gc.ca/eng/jobs/lmi/noc/index.shtml.

Among DACSO graduates, occupations were varied, but generally aligned with the programs job holders completed. In the top three occupations of DACSO high technology graduates, there was one apparent exception to this—among Physical and Life Sciences graduates, 6% of those employed were in food and beverage services.

INDICATOR O-10 (A): TOP 3 OCCUPATIONS OF DACSO GRADUATES OF HIGH TECHNOLOGY PROGRAMS

	High Technology Program			
Top 3 Occupations	Physical & Life Sciences	Computer & Information Sciences	Engineering & Related Technologies	Health & Clinical Sciences
1	Technical Occs. in Physical Sciences - 41%	Tech. Occs. in Computer & Info Systems - 26%	Tech. Occs. In Arch. Draft. Survey. & Map - 18%	Med. Technologists & Tech. (Exc. Dental) - 58%
2	Technical Occupations in Life Sciences - 11%	Computer and Info. Systems Professionals - 22%	Tech. Occs. In Civil, Mech. & Ind. Eng. - 15%	Assisting Occs. in Support of Health Srv. - 18%
3	Occupations in Food and Beverage Service - 6%	Creative Designers and Craftpersons - 9%	Tech. Occs. In Electr. & Electrical Eng. - 9%	Other Tech. Occs. in Health (Exc. Dental) - 14%

Note: Results presented are for employed graduates only.
Data source: BC Student Outcomes, DACSO Survey

Baccalaureate graduates' jobs also generally aligned with program areas. That is, the occupations seemed specific to the program area, with the exception of Physical and Life Sciences program graduates. Among baccalaureate graduates with degrees in Physical and Life Sciences, there was a wide range of occupations. These graduates were employed in 104 different occupations, compared to 66 for Computer and Information Sciences and 61 for Engineering and Related Technologies. Further, less than one-quarter (22%) of employed graduates from this program held positions in the top three occupations, and two of these top three occupations may or may not be aligned with the program area.

INDICATOR O-10 (B): TOP 3 OCCUPATIONS OF BACCALAUREATE GRADUATES OF HIGH TECHNOLOGY PROGRAMS

Top 3 Occupations	High Technology Program		
	Physical & Life Sciences	Computer & Information Sciences	Engineering & Related Technologies
1	University Professors and Assistants - 9%	Computer and Info. Systems Professionals - 52%	Civil, Mech., Elec. & Chemical Engs. - 43%
2	Sec. & Elem. School Teachers & Counsellors - 7%	Tech. Occs. in Computer & Info Systems - 9%	Computer and Info. Systems Professionals - 16%
3	Technical Occupations in Life Sciences - 6%	University Professors and Assistants - 4%	Other Engineers - 12%

Note: Results presented are for employed graduates only.
Data source: BC Student Outcomes, Baccalaureate Graduates Survey

8.5. High Technology Occupations

The indicators explained:

Employment in a high technology occupation provides graduates from high technology programs with an outlet for their skills and abilities. Working in training-related jobs shows an alignment with graduates' education and training.

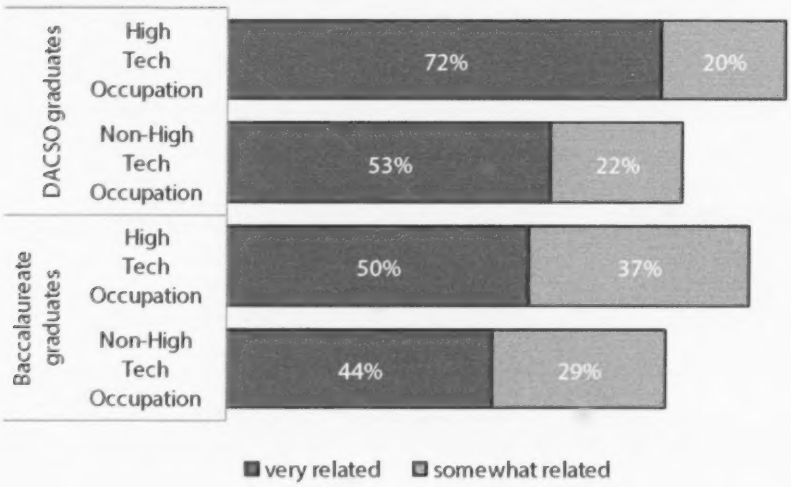
The three most common occupations among high technology job holders with diplomas, associate degrees, or certificates were medical technologists and technicians (excluding dental) (42%), computer and information systems professionals (31%), and technical occupations in electronics and electrical engineering (12%).

Among baccalaureate graduates, the three most common high technology occupations were computer and information systems professionals (49%), civil, mechanical, electrical and chemical engineers (11%), and technical occupations in the physical sciences (8%).

The majority of DACSO graduates (80%) and baccalaureate graduates (80%) who had high technology occupations graduated from high technology programs, revealing alignment between students' programs and their future occupations.

This alignment was evidenced by graduates' reports that they were working in training-related jobs. About 9 out of 10 DACSO graduates (92%) and BGS graduates (86%) held training-related high technology jobs at the time of the survey. Training-related jobs were less common among those in non-high technology occupations—three-quarters of these DACSO (75%) and BGS (72%) graduates were in training-related jobs.

INDICATOR O-11: TRAINING-RELATED JOB HELD BY DACSO AND BGS GRADUATES EMPLOYED IN HIGH TECHNOLOGY OCCUPATIONS



Most graduates were working in jobs that were related to the training they received

Note: Results presented are for those graduates who were employed at the time they were surveyed.
Data source: BC Student Outcomes, DASCO Survey and Baccalaureate Graduates Survey

In addition to the many graduates who reported working in training-related jobs, there was alignment between graduating from a high technology program and holding a high technology job.

Four out of ten (41%) DACSO graduates in high technology occupations came from Health and Clinical Sciences programs, and approximately one-quarter (27%) completed programs in Engineering and Industrial Trades. Among BGS graduates working in high technology occupations, just under one-third (31%) had degrees from Engineering and Industrial Trades programs, and just over one-quarter (27%) graduated from Computer and Information Sciences programs.

TABLE 8: GRADUATING PROGRAM FOR HIGH TECHNOLOGY JOB HOLDERS

Program of Origin	DACSO High Technology Job Holders Percent	BGS High Technology Job Holders Percent
Health and Clinical Sciences	41%	n/a
Engineering and Related Technologies	27%	31%
Computer and Information Sciences	14%	27%
Physical and Life Sciences	4%	22%
Non-High Technology	20%	20%

Note: Results presented are for those graduates who were employed in high technology occupations at the time they were surveyed.
Data source: BC Student Outcomes, DACSO Survey and Baccalaureate Graduates Survey

Looking deeper at the top three high technology occupations held by graduates, there was a fairly high degree of correspondence between occupation and high technology program area. For example, most computer and information systems professionals graduated from Computer and Information Sciences (DACSO: 43%; BGS: 54%) or Engineering and Related Technologies (DACSO: 30%; BGS: 25%) programs.

Approximately 9 out of 10 (89%) of DACSO graduates with technical occupations in electronics and electrical engineering graduated from Engineering and Related Technologies. Among BGS graduates, almost all (95%) civil, mechanical, and chemical engineers completed programs in Engineering and Related Technologies. Two-thirds (67%) of graduates with technical occupations in physical or life sciences graduated from programs in Physical and Life Sciences.

Further, almost all (95%) DACSO graduates who became medical technologists and technicians (excluding dental) completed programs in Health and Clinical Sciences.

TABLE 9: DACSO PROGRAM OF ORIGIN FOR TOP 3 HIGH TECHNOLOGY OCCUPATIONS

Program of Origin	Medical Technologists and Technicians (excl. dental)	Computer and Information Systems Professionals	Technical Occupations in Electronics and Electrical Engineering
Health and Clinical Sciences	96%	0%	0%
Engineering and Related Technologies	0%	30%	64%
Computer and Information Sciences	0%	43%	2%
Physical and Life Sciences	1%	0%	1%
Non-High Technology	3%	27%	33%

Note: Results presented are for those graduates who were employed at the time they were surveyed.
Data source: BC Student Outcomes, DASCO Survey

TABLE 10: BGS PROGRAM OF ORIGIN FOR TOP 3 HIGH TECHNOLOGY OCCUPATIONS

Program of Origin	Computer and Information Systems Professionals	Civil, Mechanical, Electrical and Chemical Engineers	Technical Occupations in Physical Sciences
Engineering and Industrial Trades	25%	95%	7%
Computer and Information Sciences	54%	1%	0%
Physical and Life Sciences	3%	3%	61%
Non-High Technology	19%	1%	32%

Note: Results presented are for those graduates who were employed at the time they were surveyed.
Data source: BC Student Outcomes, Baccalaureate Graduates Survey

8.6. Employment Characteristics

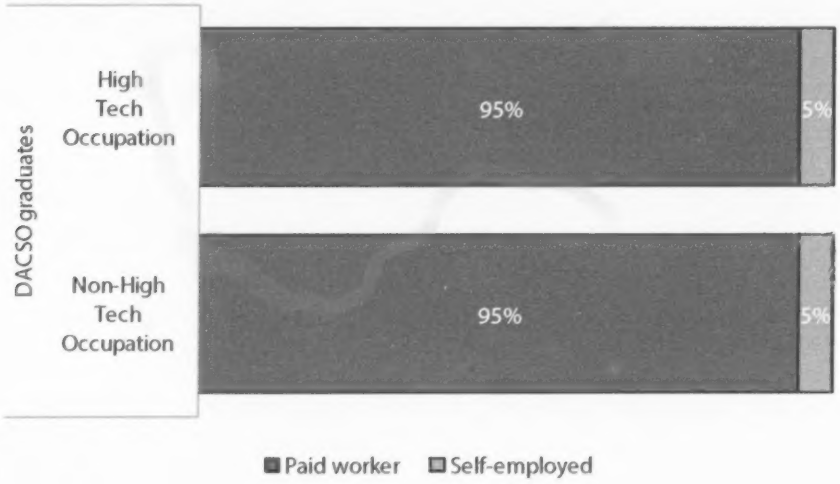
The characteristics explained:

A high proportion of individuals employed as paid workers indicates there is a market for skilled high technology workers. Self-employment suggests there is a niche for high technology-related entrepreneurship. The proportion of post-secondary graduates employed full-time in high technology occupations points to availability of work in these areas. The wages received by post-secondary graduates employed in high technology occupations indicate the demand for these jobs and the economic impact they have.

High technology job holders tended to be employed full-time as paid workers, though a portion were self-employed. Graduates in high technology jobs also had higher incomes than those who had jobs outside of high technology fields.

Most DACSO and BGS graduates (95% and 89%, respectively) worked for an employer, whether they had a high technology occupation or not.

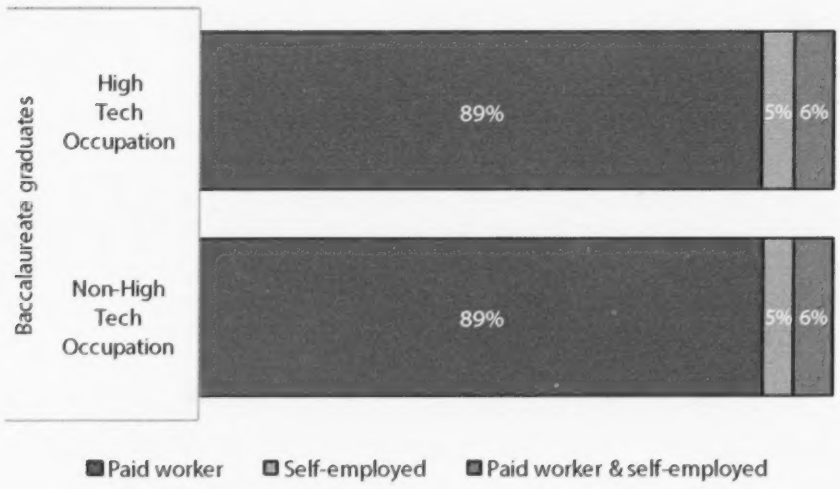
INDICATOR O-12 (A): PAID EMPLOYMENT OF DACSO GRADUATES



Most DACSO graduates worked as a paid employee, regardless of whether or not they were in a high tech occupation

Note: Results presented are for those graduates who were employed at the time they were surveyed.
Data source: BC Student Outcomes, DACSO Survey

INDICATOR O-12 (B): PAID EMPLOYMENT OF BACCALAUREATE GRADUATES

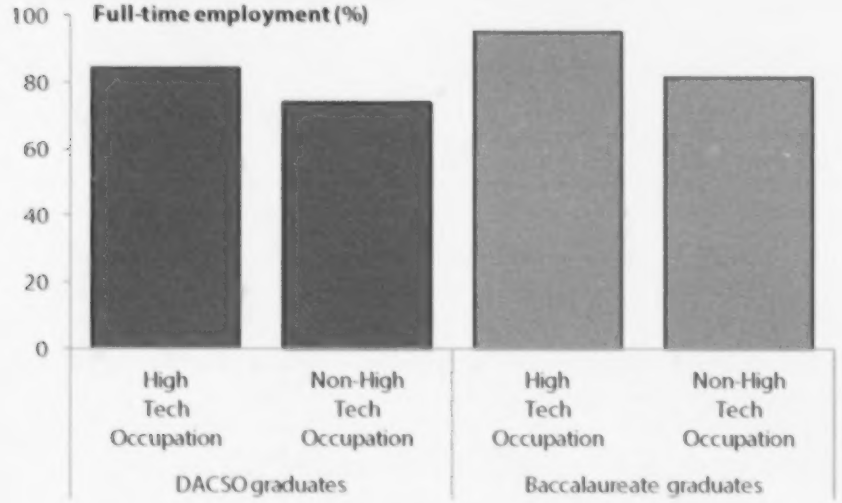


Most BGS graduates worked as a paid employee, regardless of whether or not they were in a high tech occupation

Note: Results presented are for those graduates who were employed at the time they were surveyed. In the DACSO Survey, respondents were asked if they were paid workers or self-employed. In the BGS Survey, respondents were asked if they were paid workers, self-employed, or both a paid worker and self-employed. Percentages presented for the BGS Survey represent the percentage of respondents who indicated they were solely a paid worker and those who indicated they were both a paid worker and self-employed.
Data source: BC Student Outcomes, Baccalaureate Graduates Survey

Further, graduates employed in high technology occupations were more likely than those working in non-high technology occupations to be employed full-time (30 or more hours per week). Around 84% of high technology DACSO graduates were employed full-time, compared to 74% of non-high tech graduates. The comparable figures for BGS graduates were 95% for high tech graduates versus 82% for non-high tech.

INDICATOR O-13: FULL-TIME EMPLOYMENT OF DACSO AND BGS GRADUATES EMPLOYED IN HIGH TECHNOLOGY OCCUPATIONS



More graduates working in high tech occupations had full-time employment compared to non-high tech workers

Note: Results presented are for those graduates who were employed at the time they were surveyed.
Data source: BC Student Outcomes, DACSO Survey and Baccalaureate Graduates Survey

Graduates employed in high technology occupations earned higher wages than those in non-high technology jobs. DACSO graduates in high technology occupations earned a median hourly wage of $24, while their counterparts who were not employed in high technology occupations earned a median hourly wage of just under $19. The median annual income among baccalaureate graduates employed in high technology jobs was $55,000. For those who did not hold high technology jobs, their median annual income was $44,000.

DACSO graduates who had occupations as medical technologists and technicians (excluding dental) had the highest median hourly wage at $26. For baccalaureate graduates employed in one of the top three high technology occupations, those who were civil, mechanical, electrical, and chemical engineers had the highest median annual income, at $64,000 a year.

INDICATOR O-14 (A): INCOME FOR DACSO GRADUATES EMPLOYED IN HIGH TECHNOLOGY OCCUPATIONS

	Median Hourly Wage
Not employed in High Technology Occupations	$19
Employed in High Technology Occupations	$24
Top 3 High Technology Occupations:	
Medical Technologists and Technicians (excl. Dental)	$26
Computer and Information Systems Professionals	$23
Technical Occupations in Electronics and Electrical Engineering	$22

Note: Results presented are for those graduates who were employed at the time they were surveyed.
Data source: BC Student Outcomes, DACSO Survey

INDICATOR O-14 (B): INCOME FOR BACCALAUREATE GRADUATES EMPLOYED IN HIGH TECHNOLOGY OCCUPATIONS

	Median Annual Income
Not employed in High Technology Occupations	$44,000
Employed in High Technology Occupations	$55,000
Top 3 High Technology Occupations:	
Computer and Information Systems Professionals	$56,000
Civil, Mechanical, Electrical, and Chemical Engineers	$64,000
Technical Occupations in Physical Sciences	$40,000

Note: Results presented are for those graduates who were employed at the time they were surveyed.
Data source: BC Student Outcomes, Baccalaureate Graduates Survey

9. Conclusion

British Columbia compares reasonably well with other Canadian provinces with regard to providing an environment that will attract high technology businesses.

In general, British Columbia exhibits strength in terms of performance in the education sector. British Columbia's universities have excelled in technology licenses and patents issued. The province also fares relatively well in funding for researchers in its educational institutions. On the other hand, B.C. tends to lag other provinces in indicators of overall educational attainment. Although the data for the last reporting year show that B.C. continues to have the highest percentage of the population with high school education, a rank it has held for nearly two decades, there is a deficiency with respect to the training of new graduates in some high-tech specific academic fields. Higher education research and development as a percent of GDP in the province is also low by Canadian standards.

Compared to other Canadian provinces, British Columbia returns below average ratings in about half of the business stimulus indicators, but there have also been some positive developments in recent years. In the most recent reporting year, the ratio of research and development (R&D) performance by business to provincial GDP remained at about half that of Quebec, but B.C. still holds a solid ranking of third among the provinces. British Columbia also scores below average on some other business stimulus indicators, such as patents awarded per capita, but showed signs of strength with growth in the number of high technology businesses and venture capital investment per capita.

Individual, small business and corporate taxation continue to be more favourable in B.C. than in most other parts of the country. As a share of GDP, combined federal and provincial government R&D activities are by far the lowest in Canada. However, the province fares much better in terms of gross expenditure on R&D as a share of GDP.

In relation to the size of its population, British Columbia is relatively on par with other provinces in attracting skilled immigrants, but their average level of education is slightly lower than in some other parts of the country. Meanwhile, B.C. imports of high technology goods have climbed considerably in recent years.

Unemployment rates among workers in the natural and applied sciences in B.C. have edged up and now sit slightly higher than the national average. Nonetheless, rates remain substantially lower than for the economy as a whole. In the latest reporting year, British Columbia maintained a third place ranking in terms of researchers per 100,000 population. B.C.'s largest city remains among the most desirable places to live in the

world, ranking fifth in the world for quality of life, despite its somewhat high cost of living.

Graduates from high technology-related disciplines are generally satisfied with their education and find their studies useful in the workplace. Most of these graduates are successful at finding full-time employment in fields related to their studies.

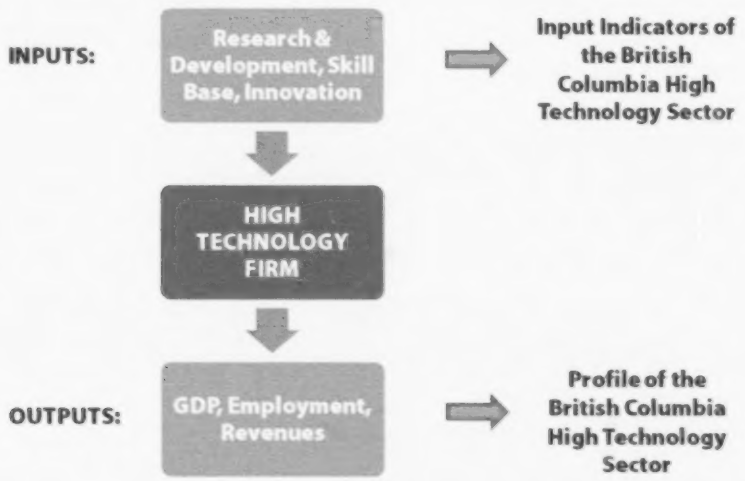
The high technology sector is an integral part of today's global economy. If provided with a hospitable environment for growth, this sector has the potential for further boosting business and employment in the province.

10. Appendix I: BC Stats' Sector Model

In BC Stats' model of the high technology sector (see "Modeling the High Technology Sector," below), the firm is the centre of the system of high technology production. The firm receives inputs, in the form of labour, physical and financial capital, raw materials and parts, and knowledge. Knowledge may be embodied in labour (human capital) or other inputs, or it may come in the form of patents and copyrights, books and electronic information, etc. Through its internal operations, the firm then produces outputs. These outputs are products and services, and (in some views) also include employment and other benefits to society.

This firm-centred view underlies BC Stats' publication strategy for high technology sector information, as shown in the diagram below.

FIGURE 1: BC STATS' PRODUCTS FOR MONITORING THE HIGH TECHNOLOGY SECTOR


INPUTS:
Research & Development, Skill Base, Innovation
Input Indicators of the British Columbia High Technology Sector
HIGH TECHNOLOGY FIRM
OUTPUTS:
GDP, Employment, Revenues
Profile of the British Columbia High Technology Sector

10.1. What is an Indicator?

The concept of indicators is well understood in the operation of machines. For instance, the dashboard of a car has many indicators. The speedometer measures the main output, which is forward motion. However, gauges such as oil pressure and water temperature assess how well the engine is working as a system. They predict the engine's future performance, and may suggest the need for specific adjustments.

Predicting the future, in terms of the economy, requires an examination of the chain of events that leads to the production of specific outputs and the development of indicators for those steps in the chain judged to be most important. Similarly, predicting the future of the high technology sector requires the development of a model of what drives growth in the sector, and then obtaining indicators for each component of the model.

In selecting indicators, consideration must be given not only to their place in a growth model of the high technology sector, but also to their accuracy and availability. Indicators should meet other tests as well. In the annual (since 1997) *Index of the Massachusetts Innovation Economy*,[28] all potential indicators are subject to a set of five criteria. The indicators selected for inclusion in the report are:

- derived from objective and reliable data sources,
- statistically measurable on an ongoing basis,
- bellwethers that reflect the fundamentals of economic vitality,
- understood and accepted by the community, and
- measurements of conditions in which there is an active public interest.

These criteria help ensure that the indicators become relevant to politicians and citizens as well as to statisticians, and have thus been adopted for this report as well.

10.2. Modeling the High Technology Sector

In 1998, BC Stats, the Information, Science and Technology Agency of British Columbia, and the Science Council of British Columbia began a collaboration to devise a model of the B.C. high technology sector, with an associated set of indicators. This resulted in two working papers. The first reviewed definitions of the high technology sector and models of the innovation economy in other jurisdictions, while the second proposed a model for use in B.C., together with a large number of potential indicators for that model.[29] Subsequently, BC Stats has simplified the model and prepared a

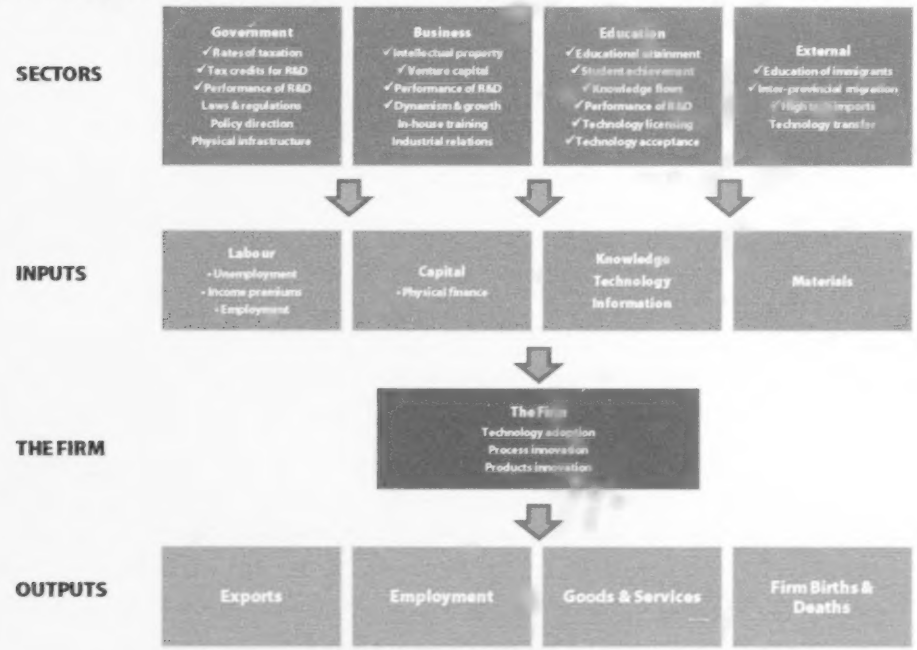
[28] Collaborative Economics and Massachusetts Technology Collaborative, Annual *Index of the Massachusetts Innovation Economy*, 2012. Available at: www.masstech.org

[29] Koebberling, Uschi and Veneranda Dettmers, "A Model of the BC High Technology Sector: Description of Factors and Linkages Affecting the Growth of the High Technology Sector in the Context of an Innovation Economy," Science Council of BC, April 1999. Available at www.llbc.leg.bc.ca/public/pubdocs/bcdocs/358283/high_technology.pdf

corresponding shorter list of indicators. The simplified model and indicators form the basis for this publication.

The traditional model of economic production focuses on land, labour and capital, which are the "factors of production" or inputs into the production process. These factors are transformed by firms, other organizations, or individuals into valued goods and services. GDP is the main measure of that value and is the most common statistic used to describe the production of economic sectors. This traditional model can be thought of as an input/output view of the economy. The inputs are obtained from a variety of sources and enter a production process, resulting in outputs.[30]

FIGURE 2: MODEL OF THE HIGH TECHNOLOGY SECTOR



The advent of the "information economy" has added a new dimension to traditional economic production, and some efforts to describe it seem quite new as well. However, the input/output view can readily be adapted to the information economy. In the model above, the firm is at the centre of the productive system. As in the traditional model, the firm receives inputs; however, knowledge, technology and information are distinguished as a unique category. This can include patents and copyrights, software, information on

[30] This is also referred to as the neoclassical model. See Lipsey, Richard G. and Kenneth Carlaw, "A Structuralist Assessment of Technology Policies—Taking Schumpeter Seriously on Policy," Working Paper #25, Industry Canada, Research Publications Program, October 1998. Available at www.ic.gc.ca/eic/site/cas-acs.nsf/eng/ra01700.html

production methods, etc. In addition, it is recognized that the other factors—labour, capital and materials—each have critical and increasing quantities of knowledge embodied in them.

The diagram then looks beyond the production inputs, to analyze their sources (the top row of boxes). For example, skilled labour may come from training courses in educational institutions, from in-house training, or from other provinces or countries. The sources for the inputs have been categorized as four "sectors." Within each sector, particular areas that bear on the production inputs are identified. These areas are the ones for which indicator variables have been sought out. The areas listed in bold, and checked, are the ones for which data are available and have been collected by BC Stats.

While the indicator variables have normally been sought out at the level of the source sectors, certain labour indicators, such as the unemployment rate, are not attributable to a single source sector. Such indicators have been grouped in a separate "labour" section.

Once the inputs are obtained by the firm, they are transformed in a way that depends on the firm's many characteristics. Some of the characteristics of most importance for high technology firms are listed within the "firm" box in the diagram.[31]

Finally, the firm produces and sells goods and services, some of which are consumed locally, while the remainder are exported, as depicted in the bottom row. It should be recognized that even with a simplified model such as the one set out here, it is possible to imagine a large number of interactions. That is, almost every box or element within the boxes could be joined by an arrow to every other box or element. In turn, a complete statistical system based on the model would track the flows of people, dollars or information along each of the pathways (arrows). Such a comprehensive approach is neither practical, nor would it necessarily lead to greater understanding and better policy. However, statistics are available on a significant number of the interactions, providing a strong source for future research.

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[31] For an in-depth study of uses of knowledge within high technology firms, see Canada's 2002 Innovation Strategy reports: Knowledge Matters: Skills and Learning for Canadians and Achieving Excellence: Investing in People, Knowledge and Opportunity available at http://publications.gc.ca/site/eng/108190/publication.html and Schuetze, Hans, Innovation, Skills, and Learning: A Study of Knowledge and Human Resources Management in Small and Medium Sized Enterprises in British Columbia, Centre for Policy Studies in Education, University of British Columbia, March 1998.

11. Appendix II: Definitions of the high technology sector

The table below describes the North American Industry Classification System-based definition of the High Tech Sector in British Columbia. This is the most recent definition developed to describe B.C.'s high technology sector. More detail on the industries and why they are included can be found in *Profile of the British Columbia High Technology Sector*, which is available at: www.bcstats.gov.bc.ca

TABLE 11: INDUSTRIES IN THE HIGH TECHNOLOGY SECTOR

NAICS	Industry Description
Manufacturing Industries	
325189	Other Inorganic Chemicals
325410	Pharmaceutical and Medicine
333310	Commercial and Service Industry
334110	Computer and Peripheral
334210	Telephone Apparatus
334220	Radio, Television Broadcasting & Wireless Communications Equipment
334290	Other Communications Equipment
334310	Audio and Video Equipment
334410	Semiconductor and Other Electronic Components
334511	Navigational and Guidance Instruments
334512	Measuring, Medical and Controlling Devices
334610	Manufacturing and Reproducing Magnetic and Optical Media
335315	Switchgear and Switchboard, and Relay and Industrial Control Apparatus
335920	Communication and Energy Wire and Cable
335990	All Other Electrical Equipment and Component
336410	Aerospace Products and Parts
339110	Medical Equipment and Supplies
Service Industries	
511211	Software Publishers (Except Video Game Publishers)
511212	Video Game Publishers
512110	Motion Picture and Video Production
512190	Post-Production and Other Motion Picture and Video Industries
515210	Pay and Specialty Television
517111	Wired Telecommunications Carriers (Except Cable)
517112	Cable and Other Program Distribution
517210	Wireless Telecommunications Carriers (Except Satellite)
517410	Satellite Telecommunications
517910	Other Telecommunications
518210	Data Processing, Hosting and Related Services
519130	Internet Publishing and Broadcasting, and Web Search Portals
541330	Engineering
541360	Geophysical Surveying and Mapping Services
541370	Surveying and Mapping (Except Geophysical) Services
541380	Testing Laboratories
541514	Computer Systems Design and Related (Except Video Game Design and Development)
541515	Video Game Design and Development Services
541620	Environmental Consulting
541690	Other Scientific and Technical Consulting
541710	Research and Development in Physical, Engineering and Life Sciences
541720	Research and Development in the Social Sciences and Humanities

12. Appendix III: Detailed Tables

12.1. Educational Indicators

INDICATOR E-1. PERCENTAGE OF THE POPULATION AGED 15 YEARS AND OLDER WITH A HIGH SCHOOL DIPLOMA

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
CANADA	74.4%	75.7%	76.2%	77.0%	77.3%	78.3%	78.9%	79.6%	80.4%	81.1%	81.5%
NL	66.0%	68.1%	67.3%	68.8%	69.7%	70.1%	70.7%	71.6%	73.3%	73.7%	74.7%
PE	69.6%	70.0%	70.6%	71.9%	72.1%	72.5%	72.6%	74.3%	76.3%	77.0%	77.6%
NS	70.8%	72.4%	73.1%	74.0%	74.1%	75.4%	75.3%	76.0%	77.8%	78.3%	79.1%
NB	69.8%	71.3%	71.8%	72.2%	73.5%	73.8%	74.6%	75.4%	76.0%	75.6%	77.3%
QC	70.1%	71.8%	72.4%	73.6%	74.1%	75.2%	75.7%	76.1%	77.0%	78.0%	78.8%
ON	75.9%	77.2%	77.7%	78.2%	78.6%	79.6%	80.2%	80.7%	81.7%	82.3%	82.6%
MB	72.0%	72.9%	73.7%	74.3%	74.3%	74.6%	76.4%	77.2%	78.0%	79.0%	79.1%
SK	71.3%	73.1%	73.5%	74.4%	74.6%	75.4%	76.7%	78.0%	78.8%	79.2%	79.8%
AB	77.7%	77.9%	78.4%	79.7%	79.7%	80.9%	81.0%	82.1%	82.2%	82.6%	82.7%
BC	**79.1%**	**80.1%**	**80.7%**	**80.9%**	**80.8%**	**81.6%**	**82.5%**	**83.4%**	**84.0%**	**84.8%**	**84.8%**

Source: Statistics Canada

INDICATOR E-2. PERCENTAGE OF THE POPULATION AGED 15 YEARS AND OLDER WITH POST-SECONDARY CREDENTIALS

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
CANADA	43.8%	44.7%	45.1%	46.5%	47.3%	48.3%	48.8%	49.2%	50.3%	51.1%	51.9%
NL	41.1%	43.1%	42.1%	43.6%	42.6%	43.6%	44.6%	46.2%	47.8%	48.9%	50.9%
PE	42.3%	43.2%	45.4%	45.1%	45.2%	44.5%	44.0%	45.6%	46.6%	48.5%	49.7%
NS	44.9%	46.0%	47.4%	47.0%	46.9%	47.3%	46.4%	48.7%	50.9%	50.4%	52.3%
NB	38.9%	39.8%	41.2%	41.2%	42.6%	43.0%	44.6%	44.9%	45.0%	45.4%	46.3%
QC	45.2%	46.7%	47.2%	48.8%	49.9%	50.7%	50.9%	51.2%	52.5%	53.6%	55.3%
ON	44.7%	45.5%	45.9%	47.5%	48.7%	50.1%	50.4%	50.7%	51.6%	52.3%	52.8%
MB	37.7%	38.4%	38.4%	39.0%	39.1%	38.9%	40.5%	41.2%	42.5%	42.4%	43.8%
SK	37.1%	39.4%	38.8%	39.3%	39.7%	40.3%	40.6%	41.3%	42.7%	43.2%	44.0%
AB	45.3%	44.8%	44.7%	46.5%	46.7%	47.6%	48.6%	49.7%	49.9%	50.3%	50.4%
BC	**42.8%**	**43.7%**	**44.5%**	**45.0%**	**45.5%**	**46.9%**	**47.4%**	**47.6%**	**49.0%**	**50.8%**	**51.1%**

Source: Statistics Canada

INDICATOR E-3, TABLE A. CANADA-WIDE RANK OF 13 YEAR-OLD ACHIEVEMENT IN SCIENCE*

	2007	2007 rank	2010	2010 rank
Alberta	524	2	515	1
Ontario	499	4	510	2
British Columbia	**488**	**5**	**497**	**3**
Prince Edward Island	464	10	493	4
Nova Scotia	480	7	489	5
Saskatchewan	480	7	488	6
New Brunswick	564	1	487	7
Newfoundland and Labrador	485	6	487	7
Quebec	511	3	486	9
Manitoba	476	9	486	9
Canada	500	n/a	500	n/a

* 2010 is the latest year for which information is available.
Source: Council of Ministers of Education, Canada

INDICATOR E-3, TABLE B. CANADA-WIDE RANK OF 13 YEAR-OLD ACHIEVEMENT IN MATHEMATICS*

	2007	2007 rank	2010	2010 rank
Quebec	517	1	515	1
Ontario	506	2	507	2
Alberta	499	3	495	3
British Columbia	**484**	**4**	**481**	**4**
New Brunswick	461	7	478	5
Saskatchewan	461	7	474	6
Nova Scotia	457	9	474	6
Newfoundland and Labrador	478	6	472	8
Manitoba	479	5	468	9
Prince Edward Island	450	10	460	10
Canada	500	n/a	500	n/a

* 2010 is the latest year for which information is available.
Source: Council of Ministers of Education, Canada

Notes for Indicators E-4 through E-8:
As of 2009, the college graduate counts are based on the calendar year to align with how university graduates are reported. For years prior to 2009, college graduate counts were based on an academic year. Due to the transition, some graduates reported in 2009 may have also been reported in 2008.
From 2005 to 2008, figures for the graduates from the University of Regina are not available and are therefore not included in the counts for Saskatchewan.

INDICATOR E-4, TABLE A. TOTAL BACHELOR DEGREES AWARDED PER 100,000 PERSONS AGED 15 YEARS AND OLDER*

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
CANADA	520.6	519.9	532.9	552.8	576.1	580.0	608.7	654.8	625.7	614.5	613.0
NL	501.9	507.1	504.5	534.6	530.2	558.6	637.4	641.6	608.0	591.5	574.7
PE	450.0	471.0	429.9	490.3	517.9	570.8	530.8	567.8	581.0	573.3	487.7
NS	767.4	730.7	732.5	813.8	856.8	873.2	929.6	1001.1	881.0	866.1	840.8
NB	539.6	539.4	579.4	588.5	638.9	682.1	721.6	697.4	710.1	662.8	642.9
QC	456.8	455.4	466.6	477.1	499.8	503.3	511.3	513.0	516.3	509.9	507.2
ON	571.0	566.1	577.2	604.7	630.2	651.9	694.0	797.1	749.6	716.1	719.7
MB	500.0	503.4	496.9	546.0	572.3	562.4	595.9	603.4	656.9	601.6	589.8
SK	560.2	563.2	559.1	567.2	558.5	371.9	368.3	362.8	372.2	553.4	494.8
AB	485.7	503.4	540.9	556.6	576.6	563.2	559.0	582.7	537.0	539.9	539.2
BC	**469.5**	**473.2**	**487.3**	**485.1**	**506.0**	**504.8**	**553.2**	**565.7**	**528.1**	**537.7**	**550.1**

* 2011 is the latest year for which information is available.
Source: Statistics Canada

INDICATOR E-4, TABLE B. TOTAL BACHELOR DEGREES AWARDED*

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
CANADA	130,995	132,708	137,733	144,759	152,925	156,156	166,227	181,428	175,902	175,170	176,847
NL	2,172	2,193	2,187	2,322	2,301	2,415	2,739	2,760	2,631	2,577	2,511
PE	495	522	480	552	588	651	609	660	684	687	597
NS	5,877	5,640	5,694	6,369	6,732	6,897	7,350	7,950	7,038	6,969	6,807
NB	3,336	3,345	3,606	3,675	3,999	4,275	4,533	4,401	4,509	4,233	4,125
QC	27,822	27,969	28,893	29,823	31,557	32,121	32,976	33,438	34,035	33,999	34,164
ON	54,753	55,362	57,372	61,077	64,641	67,866	73,254	85,344	81,354	78,885	80,346
MB	4,566	4,632	4,614	5,130	5,421	5,373	5,751	5,892	6,498	6,036	5,997
SK	4,428	4,455	4,440	4,530	4,467	2,982	2,982	2,979	3,105	4,683	4,239
AB	11,808	12,579	13,806	14,517	15,486	15,633	15,990	17,082	16,125	16,437	16,650
BC	**15,738**	**16,008**	**16,641**	**16,764**	**17,730**	**17,949**	**20,043**	**20,922**	**19,926**	**20,664**	**21,402**

* 2011 is the latest year for which information is available.
Source: Statistics Canada

INDICATOR E-5, TABLE A. TOTAL GRADUATE DEGREES AWARDED PER 100,000 PERSONS AGED 15 YEARS AND OLDER*

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
CANADA	111.6	112.2	116.3	125.6	138.5	137.2	140.6	143.7	148.2	154.2	161.7
NL	98.4	82.5	93.4	93.2	119.6	104.1	135.4	135.3	120.6	140.5	143.5
PE	10.9	10.8	24.2	21.3	29.1	28.9	81.1	49.0	58.6	65.1	41.7
NS	144.6	162.1	170.2	192.8	238.6	235.1	242.8	230.8	254.2	242.0	258.3
NB	72.8	71.1	71.3	74.0	89.1	91.9	87.4	87.0	93.1	100.1	93.5
QC	141.7	142.8	145.1	162.2	170.0	176.8	173.4	174.9	181.1	177.9	182.0
ON	114.6	114.7	119.3	127.8	135.6	138.2	137.8	141.4	152.7	164.9	178.0
MB	59.5	61.3	75.9	59.7	65.6	75.0	77.1	82.3	80.4	77.1	74.4
SK	77.8	82.3	81.6	86.0	87.8	62.1	61.5	60.7	69.8	109.6	112.4
AB	91.1	99.7	99.3	105.4	125.8	102.5	126.2	130.6	114.6	118.5	124.2
BC	**92.2**	**84.8**	**91.7**	**99.7**	**126.8**	**120.6**	**128.7**	**138.6**	**135.6**	**138.9**	**143.6**

* 2011 is the latest year for which information is available.
Source: Statistics Canada

INDICATOR E-5, TABLE B. TOTAL GRADUATE DEGREES AWARDED*

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
CANADA	28,689	28,629	30,066	32,889	36,759	36,933	38,388	39,819	41,670	43,947	46,641
NL	426	357	405	405	519	450	582	582	522	612	627
PE	12	12	27	24	33	33	93	57	69	78	51
NS	1,107	1,251	1,323	1,509	1,875	1,857	1,920	1,833	2,031	1,947	2,091
NB	450	441	444	462	558	576	549	549	591	639	600
QC	8,634	8,769	8,985	10,137	10,731	11,280	11,181	11,400	11,940	11,862	12,261
ON	10,989	11,220	11,862	12,909	13,905	14,385	14,550	15,144	16,575	18,165	19,872
MB	543	564	705	561	621	717	744	804	795	774	756
SK	615	651	648	687	702	498	498	498	582	927	963
AB	2,214	2,490	2,535	2,748	3,378	2,844	3,609	3,828	3,441	3,609	3,834
BC	**3,090**	**2,868**	**3,132**	**3,444**	**4,443**	**4,290**	**4,662**	**5,124**	**5,115**	**5,337**	**5,589**

* 2011 is the latest year for which information is available.
Source: Statistics Canada

INDICATOR E-6 (A), TABLE A. ARCHITECTURE, ENGINEERING AND RELATED TECHNOLOGY BACHELOR DEGREES AWARDED PER 100,000 PERSONS AGED 15 YEARS AND OLDER*

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
CANADA	38.9	39.6	41.0	44.2	44.8	43.7	45.2	47.9	46.9	43.9	45.6
NL	28.4	37.5	39.4	48.3	53.9	56.2	70.5	78.1	59.6	50.3	57.7
PE	-	-	-	-	2.6	-	-	2.6	2.5	-	-
NS	50.9	36.5	33.6	42.2	38.9	41.8	45.9	48.7	51.4	51.4	57.1
NB	39.8	36.3	31.8	31.7	34.5	37.3	44.9	45.2	54.8	44.6	42.5
QC	44.8	48.2	46.9	50.6	54.3	53.8	53.4	55.8	54.6	51.2	50.8
ON	43.1	44.0	47.8	51.4	50.8	50.1	52.0	56.5	53.5	48.4	50.8
MB	22.7	24.1	24.2	24.3	28.2	25.1	27.7	25.5	30.0	24.5	32.2
SK	43.3	43.2	43.1	47.0	45.4	31.8	31.5	31.1	33.4	42.9	40.3
AB	36.7	36.4	40.3	42.7	41.3	37.7	37.2	38.4	40.2	39.7	40.6
BC	**21.8**	**21.2**	**20.5**	**21.7**	**21.5**	**21.5**	**24.3**	**26.0**	**25.8**	**26.7**	**29.6**

- Not available or zero

* 2011 is the latest year for which information is available.

Source: Statistics Canada

INDICATOR E-6 (A), TABLE B. ARCHITECTURE, ENGINEERING AND RELATED TECHNOLOGY BACHELOR DEGREES AWARDED*

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
CANADA	9,789	10,119	10,587	11,565	11,898	11,757	12,351	13,284	13,182	12,516	13,155
NL	123	162	171	210	234	243	303	336	258	219	252
PE	-	-	-	-	3	-	-	3	3	-	-
NS	390	282	261	330	306	330	363	387	411	414	462
NB	246	225	198	198	216	234	282	285	348	285	273
QC	2,727	2,961	2,907	3,165	3,429	3,435	3,447	3,639	3,597	3,417	3,420
ON	4,131	4,299	4,755	5,193	5,214	5,211	5,490	6,048	5,808	5,334	5,667
MB	207	222	225	228	267	240	267	249	297	246	327
SK	342	342	342	375	363	255	255	255	279	363	345
AB	891	909	1,029	1,113	1,110	1,047	1,065	1,125	1,206	1,209	1,254
BC	**732**	**717**	**699**	**750**	**753**	**765**	**882**	**960**	**975**	**1,026**	**1,152**

- Not available or zero

* 2011 is the latest year for which information is available.

Source: Statistics Canada

INDICATOR E-6 (B), TABLE A. ARCHITECTURE, ENGINEERING AND RELATED TECHNOLOGY GRADUATE DEGREES AWARDED PER 100,000 PERSONS AGED 15 YEARS AND OLDER*

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
CANADA	11.8	12.0	13.8	15.9	18.8	19.3	18.9	18.9	19.0	19.9	21.0
NL	6.9	8.3	7.6	9.0	8.3	7.6	14.0	16.0	14.6	14.5	16.5
PE	-	-	-	-	-	-	-	-	-	-	-
NS	8.2	14.4	16.2	15.3	25.6	24.7	20.9	16.6	16.9	17.9	22.2
NB	9.2	7.3	6.7	8.6	12.0	16.3	13.8	12.8	10.4	10.8	13.1
QC	16.8	15.2	16.3	20.8	24.9	28.2	27.1	24.6	25.9	25.9	24.8
ON	11.3	12.0	14.3	16.8	18.9	19.1	18.7	19.1	19.9	22.1	24.3
MB	10.5	11.7	18.4	11.8	14.9	15.4	13.4	16.9	14.3	12.3	13.3
SK	9.9	10.2	9.8	10.1	13.9	9.7	9.6	9.5	7.6	12.4	13.7
AB	10.0	11.5	14.0	15.1	20.8	15.8	18.2	23.5	19.5	20.1	20.6
BC	**9.4**	**8.8**	**9.2**	**10.9**	**10.4**	**12.1**	**11.3**	**10.2**	**10.9**	**10.3**	**11.3**

- Not available or zero

* 2011 is the latest year for which information is available.

Source: Statistics Canada

INDICATOR E-6 (B), TABLE B. ARCHITECTURE, ENGINEERING AND RELATED TECHNOLOGY GRADUATE DEGREES AWARDED*

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
CANADA	2,979	3,069	3,558	4,176	5,001	5,196	5,172	5,244	5,328	5,673	6,045
NL	30	36	33	39	36	33	60	69	63	63	72
PE	-	-	-	-	-	-	-	-	-	-	-
NS	63	111	126	120	201	195	165	132	135	144	180
NB	57	45	42	54	75	102	87	81	66	69	84
QC	1,023	936	1,011	1,302	1,572	1,797	1,746	1,605	1,707	1,728	1,668
ON	1,080	1,176	1,422	1,695	1,941	1,989	1,977	2,046	2,157	2,436	2,715
MB	96	108	171	111	141	147	129	165	141	123	135
SK	78	81	78	81	111	78	78	78	63	105	117
AB	243	288	357	393	558	438	522	690	585	612	636
BC	**315**	**297**	**315**	**378**	**363**	**432**	**411**	**378**	**411**	**396**	**441**

- Not available or zero

* 2011 is the latest year for which information is available.

Source: Statistics Canada

INDICATOR E-7 (A), TABLE A. MATHEMATICS, COMPUTER AND INFORMATION SCIENCES BACHELOR DEGREES AWARDED PER 100,000 PERSONS AGED 15 YEARS AND OLDER*

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
CANADA	25.5	27.3	29.6	30.2	30.6	26.8	24.8	21.8	19.6	17.2	16.1
NL	15.9	20.8	16.6	18.6	14.5	19.4	15.4	15.3	13.2	13.1	10.3
PE	5.5	8.1	13.4	10.7	13.2	15.8	7.8	7.7	15.3	15.0	12.3
NS	36.0	29.9	32.4	39.5	38.9	42.9	34.1	24.6	25.5	23.1	18.2
NB	20.4	29.0	32.3	30.3	29.7	29.7	22.0	19.0	16.1	13.6	12.6
QC	23.2	23.2	23.6	22.0	19.9	16.4	15.2	12.5	12.5	11.4	10.6
ON	30.3	32.9	37.5	39.6	41.6	34.4	33.3	29.7	26.7	21.9	20.9
MB	24.0	21.2	13.2	13.1	19.3	15.7	16.8	13.8	17.0	12.6	11.8
SK	27.3	26.9	30.6	24.4	25.5	13.8	13.7	13.5	7.6	7.4	7.7
AB	14.3	18.5	19.5	22.7	24.2	27.1	21.9	20.0	15.4	14.0	13.3
BC	**25.0**	**27.8**	**30.6**	**30.4**	**28.2**	**26.5**	**24.8**	**21.7**	**19.2**	**20.0**	**18.0**

* 2011 is the latest year for which information is available.

Source: Statistics Canada

INDICATOR E-7 (A), TABLE B. MATHEMATICS, COMPUTER AND INFORMATION SCIENCES BACHELOR DEGREES AWARDED*

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
CANADA	6,414	6,960	7,638	7,920	8,121	7,212	6,771	6,027	5,520	4,902	4,632
NL	69	90	72	81	63	84	66	66	57	57	45
PE	6	9	15	12	15	18	9	9	18	18	15
NS	276	231	252	309	306	339	270	195	204	186	147
NB	126	180	201	189	186	186	138	120	102	87	81
QC	1,413	1,422	1,464	1,377	1,254	1,047	981	813	822	759	714
ON	2,901	3,219	3,732	3,999	4,272	3,582	3,510	3,183	2,901	2,409	2,331
MB	219	195	123	123	183	150	162	135	168	126	120
SK	216	213	243	195	204	111	111	111	63	63	66
AB	348	462	498	591	651	753	627	585	462	426	411
BC	**837**	**942**	**1,044**	**1,050**	**987**	**942**	**897**	**804**	**726**	**768**	**699**

* 2011 is the latest year for which information is available.

Source: Statistics Canada

INDICATOR E-7 (B), TABLE A. MATHEMATICS, COMPUTER AND INFORMATION SCIENCES GRADUATE DEGREES AWARDED PER 100,000 PERSONS AGED 15 YEARS AND OLDER*

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
CANADA	5.3	5.5	6.3	6.9	8.2	8.4	8.5	8.1	8.2	8.1	8.6
NL	1.4	1.4	2.1	2.8	2.1	1.4	5.6	4.9	5.5	4.1	4.1
PE	-	-	-	-	-	-	-	-	-	-	-
NS	12.5	8.6	9.6	11.5	14.1	18.2	15.9	12.1	12.8	13.4	11.1
NB	2.4	1.9	2.9	4.3	2.4	6.2	5.3	6.2	4.3	4.7	3.7
QC	6.9	6.7	7.2	8.0	9.1	9.4	9.3	8.7	8.6	8.1	7.8
ON	5.6	6.0	6.9	7.4	9.1	9.7	9.3	8.9	9.8	9.6	11.2
MB	2.3	1.0	1.6	2.2	2.5	2.8	2.8	3.1	2.4	2.1	2.1
SK	3.8	2.7	3.4	3.0	4.9	2.2	2.2	2.2	2.5	4.6	5.3
AB	3.6	4.0	5.3	6.0	8.5	6.9	8.9	8.0	7.5	8.1	6.8
BC	**3.8**	**5.8**	**6.1**	**6.5**	**7.2**	**7.2**	**7.5**	**7.9**	**7.0**	**6.5**	**7.9**

- Not available or zero

* 2011 is the latest year for which information is available.

Source: Statistics Canada

INDICATOR E-7 (B), TABLE B. MATHEMATICS, COMPUTER AND INFORMATION SCIENCES GRADUATE DEGREES AWARDED*

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
CANADA	1,341	1,407	1,620	1,809	2,178	2,274	2,331	2,253	2,316	2,307	2,484
NL	6	6	9	12	9	6	24	21	24	18	18
PE	-	-	-	-	-	-	-	-	-	-	-
NS	96	66	75	90	111	144	126	96	102	108	90
NB	15	12	18	27	15	39	33	39	27	30	24
QC	420	414	444	501	573	597	597	567	564	540	522
ON	534	582	684	744	930	1,005	981	957	1,062	1,056	1,248
MB	21	9	15	21	24	27	27	30	24	21	21
SK	30	21	27	24	39	18	18	18	21	39	45
AB	87	99	135	156	228	192	255	234	225	246	210
BC	**126**	**195**	**210**	**225**	**252**	**255**	**270**	**291**	**264**	**249**	**309**

- Not available or zero

* 2011 is the latest year for which information is available.

Source: Statistics Canada

INDICATOR E-8 (A), TABLE A. PHYSICAL AND LIFE SCIENCES BACHELOR DEGREES AWARDED PER 100,000 PERSONS AGED 15 YEARS AND OLDER*

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
CANADA	46.5	45.3	42.5	42.8	41.9	44.9	48.2	54.0	51.8	50.4	47.7
NL	74.9	62.4	58.1	55.9	56.0	52.7	59.3	60.0	54.8	56.5	63.2
PE	81.8	73.1	48.4	63.9	84.6	92.1	78.4	77.4	94.3	57.6	58.8
NS	78.0	78.9	76.0	83.2	84.0	89.3	97.5	104.6	87.1	84.3	84.9
NB	48.5	40.6	42.4	43.7	45.1	42.6	46.8	43.3	52.0	39.9	38.8
QC	32.7	32.8	32.8	28.5	29.8	29.8	29.6	27.7	28.0	26.9	25.9
ON	53.2	51.8	48.1	50.5	50.1	53.4	56.4	73.1	67.8	69.0	61.3
MB	54.9	47.9	18.7	20.8	29.5	30.1	32.3	27.0	34.3	28.7	34.8
SK	35.3	33.0	30.6	34.2	31.5	24.3	24.1	23.8	32.0	33.3	34.0
AB	41.6	43.5	45.6	46.2	30.7	46.0	52.4	54.7	51.8	47.7	49.6
BC	**44.8**	**43.9**	**41.7**	**40.7**	**42.1**	**43.8**	**52.0**	**49.2**	**48.3**	**44.3**	**43.9**

* 2011 is the latest year for which information is available.
Source: Statistics Canada

INDICATOR E-8 (A), TABLE B. PHYSICAL AND LIFE SCIENCES BACHELOR DEGREES AWARDED*

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
CANADA	11,694	11,562	10,977	11,205	11,130	12,084	13,164	14,970	14,556	14,364	13,767
NL	324	270	252	243	243	228	255	258	237	246	276
PE	90	81	54	72	96	105	90	90	111	69	72
NS	597	609	591	651	660	705	771	831	696	678	687
NB	300	252	264	273	282	267	294	273	330	255	249
QC	1,989	2,016	2,031	1,782	1,881	1,902	1,908	1,806	1,845	1,794	1,746
ON	5,100	5,064	4,782	5,100	5,139	5,556	5,958	7,830	7,356	7,599	6,849
MB	501	441	174	195	279	288	312	264	339	288	354
SK	279	261	243	273	252	195	195	195	267	282	291
AB	1,011	1,086	1,164	1,206	825	1,278	1,500	1,605	1,554	1,452	1,533
BC	**1,503**	**1,485**	**1,425**	**1,407**	**1,476**	**1,557**	**1,884**	**1,821**	**1,821**	**1,701**	**1,707**

* 2011 is the latest year for which information is available.
Source: Statistics Canada

INDICATOR E-8 (B), TABLE A. PHYSICAL AND LIFE SCIENCES GRADUATE DEGREES AWARDED PER 100,000 PERSONS AGED 15 YEARS AND OLDER*

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
CANADA	11.1	11.5	11.7	12.3	12.7	12.6	13.5	13.7	14.1	14.6	15.4
NL	20.1	5.5	7.6	8.3	9.7	11.8	12.6	10.5	11.1	17.2	13.7
PE	-	-	-	-	-	-	-	-	-	-	-
NS	8.2	12.4	10.8	12.3	15.3	17.1	18.6	18.9	16.1	16.0	18.5
NB	5.8	7.3	5.3	6.2	8.1	9.1	8.1	8.6	8.5	6.6	7.0
QC	14.1	16.3	16.5	17.9	18.6	18.8	18.6	19.1	19.3	19.0	19.4
ON	10.9	11.5	11.7	11.8	12.5	12.2	13.4	13.5	14.2	15.4	16.7
MB	8.9	6.2	9.4	7.0	8.6	8.8	9.3	8.6	7.6	8.7	8.0
SK	9.1	8.0	8.7	8.3	7.1	5.6	5.6	5.5	7.9	9.2	10.2
AB	9.6	8.9	9.3	10.5	7.6	7.8	11.2	11.6	12.3	11.8	12.4
BC	**9.3**	**9.0**	**8.9**	**9.4**	**10.4**	**9.5**	**10.2**	**10.4**	**11.1**	**10.9**	**11.6**

- Not available or zero
* 2011 is the latest year for which information is available.
Source: Statistics Canada

INDICATOR E-8 (B), TABLE B. PHYSICAL AND LIFE SCIENCES GRADUATE DEGREES AWARDED*

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
CANADA	2,790	2,943	3,030	3,216	3,381	3,402	3,699	3,792	3,972	4,167	4,434
NL	87	24	33	36	42	51	54	45	48	75	60
PE	-	-	-	-	-	-	-	-	-	6	6
NS	63	96	84	96	120	135	147	150	129	129	150
NB	36	45	33	39	51	57	51	54	54	42	45
QC	861	1,002	1,023	1,119	1,176	1,197	1,197	1,248	1,272	1,269	1,305
ON	1,044	1,125	1,161	1,191	1,287	1,275	1,419	1,446	1,539	1,698	1,869
MB	81	57	87	66	81	84	90	84	75	87	81
SK	72	63	69	66	57	45	45	45	66	78	87
AB	234	222	237	273	204	216	321	339	369	360	384
BC	**312**	**303**	**303**	**324**	**366**	**339**	**369**	**384**	**417**	**420**	**450**

- Not available or zero
* 2011 is the latest year for which information is available.
Source: Statistics Canada

INDICATOR E-9. PERCENTAGE OF HOUSEHOLDS WITH HOME COMPUTERS

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
CANADA	59.8	64.1	66.6	68.7	72.0	75.4	78.4	79.4	81.7	82.7	84.5
NL	48.8	50.6	51.3	55.2	60.8	66.0	65.9	69.9	71.5	77.4	76.5
PE	48.5	52.3	57.3	63.3	65.6	69.2	72.2	71.9	79.0	77.7	75.7
NS	56.1	57.7	61.1	63.5	66.8	71.0	73.0	75.4	79.6	79.7	79.9
NB	48.3	49.3	53.2	57.9	61.8	67.7	70.0	72.5	74.4	74.5	78.7
QC	50.9	56.8	59.2	61.4	65.7	69.2	70.9	74.2	76.0	78.5	80.0
ON	66.2	68.4	71.7	72.6	75.8	78.3	82.7	83.1	84.5	83.7	85.7
MB	51.2	56.4	60.5	65.1	65.5	69.5	74.6	74.6	79.9	79.0	80.1
SK	51.4	57.5	60.1	63.3	68.9	68.8	72.3	77.0	79.6	78.8	82.4
AB	65.9	70.4	72.3	73.5	76.8	83.4	82.9	85.6	86.2	88.3	90.7
BC	**64.2**	**71.4**	**71.9**	**75.2**	**76.8**	**79.9**	**84.1**	**85.0**	**84.9**	**88.0**	**89.0**

* 2011 is the latest year for which information is available

Source: Statistics Canada

INDICATOR E-10. PERCENTAGE OF HOUSEHOLDS USING THE INTERNET (%)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
CANADA	49.9	54.5	56.9	59.8	64.1	68.1	72.7	74.6	77.8	78.4	80.5
NL	39.6	39.9	40.3	44.6	52.1	57.9	60.2	65.5	68.1	72.3	72.6
PE	39.7	42.3	48.9	51.5	58.0	62.3	64.7	67.9	73.7	72.8	72.7
NS	45.5	47.9	52.4	55.4	59.3	63.6	66.5	69.9	73.7	75.1	76.5
NB	40.1	41.6	44.7	47.1	52.7	58.4	62.9	65.4	69.4	69.2	72.6
QC	40.8	46.1	47.8	50.0	55.5	59.8	63.6	67.1	71.2	73.3	74.3
ON	57.1	58.9	63.0	65.0	69.4	72.0	78.1	77.4	80.7	80.2	82.4
MB	42.1	47.0	50.0	54.6	57.6	60.6	66.2	67.3	76.0	74.0	76.5
SK	40.6	48.0	51.3	54.7	61.7	61.0	66.2	72.7	74.4	73.7	78.8
AB	55.4	60.5	61.2	66.0	69.2	76.5	77.9	81.3	82.9	84.2	87.3
BC	**52.3**	**61.6**	**63.2**	**67.5**	**70.5**	**74.2**	**79.3**	**82.1**	**83.2**	**83.7**	**86.2**

* 2011 is the latest year for which information is available

Source: Statistics Canada

INDICATOR E-11. GROSS INCOME FROM TECHNOLOGY LICENSES AT U-15 UNIVERSITIES (IN $ THOUSANDS CDN)*

INSTITUTION	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Dalhousie U	-	-	25	-	149	298	519	620	533	617	576
U of Toronto	2,520	1,559	2,733	2,928	1,578	1,486	1,917	2,045	8,234	2,168	2,694
U of Ottawa	92	52	60	255	112	341	279	911	-	401	291
McMaster U	905	731	887	976	1,528	1,444	1,512	950	1,325	1,038	1,250
U of Western Ont	206	811	394	1,089	4,187	4,791	3,960	4,009	4,223	4,529	4,251
Queens U	4,197	4,373	4,874	6,169	895	3,500	2,071	1,266	2,416	1,467	1,878
U of Waterloo	1,171	813	827	811	778	562	451	807	425	390	323
U of Montreal	4,285	522	826	1,725	-	1,123	836	792	493	1,026	1,128
McGill U	9,920	1,529	2,028	1,507	1,580	1,487	1,567	2,574	875	1,192	952
U Laval	169	-	-	-	-	-	-	-	-	2,542	1,501
U of Manitoba	1,894	2,458	2,358	2,178	1,677	2,843	2,226	1,759	2,139	2,058	2,228
U of Saskatchewa	799	959	1,233	1,178	1,091	1,303	1,252	2,214	5,593	6,533	6,865
U of Alberta	7,615	2,109	1,497	1,091	1,054	1,136	1,771	2,030	873	889	1,651
U of Calgary	3,041	2,702	4,095	3,309	3,414	4,409	4,991	4,934	5,674	6,217	-
U of BC	**8,513**	**11,676**	**13,494**	**13,738**	**15,728**	**15,716**	**13,431**	**6,444**	**5,580**	**5,502**	**8,441**

Note: The University of Western Ontario includes Lawson Health Research Institute and Robarts Research Institute.

McMaster University includes Hamilton Health Science and St. Joseph's Healthcare Hamilton.

The University of Calgary includes UTI incorporated.

- Not available or zero

* 2011 is the latest year for which information is available

Source: Association of University Technology Managers

LICENSES AND OPTIONS YIELDING INCOME AT CANADIAN U-15 UNIVERSITIES (ACTUAL)*

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Dalhousie U	..	..	5	..	4	4	5	5	5	4	4
U of Toronto	36	21	45	32	53	55	58	53	53	63	58
U of Ottawa	4	5	5	9	8	11	10	9	7	12	9
McMaster U	39	43	55	59	86	78	100	110	110	91	109
U of Western Ont.	28	46	18	31	41	46	52	43	56	47	56
Queens U	29	29	31	35	43	42	37	37	41	43	43
U of Waterloo	22	30	22	37	28	16	11	14	18	8	8
U of Montreal	18	31	19	23	..	25	20	13	39	43	45
McGill U	38	40	43	79	54	69	90	77	81	67	97
U Laval	10	..	12	16	18	..	19	35	..	48	44
U of Manitoba	21	29	26	31	22	30	38	24	33	42	45
U of Saskatchewa	77	65	88	73	72	74	69	80	80	115	78
U of Alberta	36	40	42	46	32	49	49	53	40	49	42
U of Calgary	54	73	85	86	31	67	51	48	33	15	..
U of BC	**71**	**73**	**65**	**90**	**91**	**90**	**98**	**77**	**112**	**103**	**116**

Note: The University of Western Ontario includes Lawson Health Research Institute and Robarts Research Institute.
McMaster University includes Hamilton Health Science and St. Joseph's Healthcare Hamilton.
The University of Calgary includes UTI incorporated.
.. Not available or zero.
* 2011 is the latest year for which information is available.
Source: Association of University Technology Managers

GROSS INCOME PER TECHNOLOGY LICENSE AT U-15 UNIVERSITIES (IN $ THOUSANDS CDN)*

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Dalhousie U	..	..	5	..	37	75	104	124	107	154	144
U of Toronto	70	74	61	91	30	27	33	39	155	34	46
U of Ottawa	23	10	12	28	14	11	28	101	..	34	32
McMaster U	23	17	16	17	18	19	15	9	12	11	11
U of Western Ont.	7	18	22	35	102	104	76	93	75	96	76
Queens U	145	151	157	176	21	83	56	34	59	34	44
U of Waterloo	53	27	38	22	28	15	41	58	24	49	40
U of Montreal	238	17	43	75	..	45	42	61	13	25	25
McGill U	261	38	47	19	29	22	17	33	11	18	10
U Laval	17	..	..	..	..	..	..	..	..	53	34
U of Manitoba	90	85	91	70	76	95	59	73	65	49	50
U of Saskatchewa	10	15	14	16	15	18	18	28	70	57	88
U of Alberta	212	53	36	24	33	23	36	38	22	18	87
U of Calgary	56	37	48	38	111	66	98	103	172	414	..
U of BC	**120**	**160**	**208**	**153**	**173**	**175**	**137**	**84**	**50**	**53**	**73**

Note: The University of Western Ontario includes Lawson Health Research Institute and Robarts Research Institute.
McMaster University includes Hamilton Health Science and St. Joseph's Healthcare Hamilton.
The University of Calgary includes UTI incorporated.
.. Not available or zero.
* 2011 is the latest year for which information is available.
Source: Association of University Technology Managers

INDICATOR E-12. NUMBER OF U.S. PATENTS ISSUED TO U-15 UNIVERSITIES (ACTUAL)*

INSTITUTION	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2007-2011
Dalhousie U	..	..	7	..	1	..	..	..	..	..	1	3
U of Toronto	11	11	3	4	8	15	16	15	7	14	22	74
U of Ottawa	4	3	4	5	3	6	8	3	7	2	9	29
McMaster U	1	5	3	7	2	2	6	3	10	4	3	26
U of Western Ont.	3	1	4	7	8	8	3	6	3	10	10	32
Queens U	17	17	14	7	8	6	10	9	9	8	10	46
U of Waterloo	4	2	6	..	..	1	..	1	1	2	2	6
U of Montreal	11	17	11	4	..	1	4	4	9	6	19	42
McGill U	28	19	45	30	10	15	19	8	12	17	10	66
U of Laval	5	9	8	11	3	..	20	4	..	9	7	40
U of Manitoba	3	4	5	6	8	2	7	8	1	3	3	22
U of Saskatchewa	..	2	2	4	12	6	8	5	4	8	9	34
U of Alberta	13	18	11	13	10	8	9	8	8	7	7	39
U of Calgary	13	14	13	6	10	7	14	3	3	7	..	27
U of BC	**29**	**29**	**19**	**18**	**25**	**14**	**18**	**13**	**13**	**16**	**13**	**73**

Note: The University of Western Ontario includes Lawson Health Research Institute and Robarts Research Institute.
McMaster University includes Hamilton Health Science and St. Joseph's Healthcare Hamilton.
The University of Calgary includes UTI incorporated.
.. Not available or zero.
* 2011 is the latest year for which information is available.
Source: Association of University Technology Managers

INDICATOR E-13. NUMBER OF UNIVERSITY START-UP COMPANIES FORMED (ACTUAL)*

INSTITUTION	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Dalhousie	-	-	-	-	-	-	-	1	-	1	-
U of Toronto	6	8	7	5	3	1	8	7	7	18	23
U of Ottawa	2	2	1	-	1	7	5	5	1	-	6
McMaster U	1	-	-	-	2	-	-	-	-	-	1
U of Western Ont.	2	-	-	2	5	3	3	-	6	3	2
Queens U	1	-	-	6	3	1	1	-	-	1	1
U of Waterloo	1	-	13	7	2	2	2	1	5	5	4
U of Montreal	4	7	3	2	-	-	1	1	1	1	3
McGill U	5	4	5	5	1	1	1	2	1	-	1
U of Laval	5	-	3	-	-	-	-	1	-	-	-
U of Manitoba	1	1	-	1	-	2	2	-	2	-	-
U of Saskatchewa	3	-	3	3	-	-	1	2	-	2	1
U of Alberta	8	5	4	3	2	3	4	2	2	4	4
U of Calgary	3	4	3	-	-	-	-	1	-	2	-
U of BC	**13**	**5**	**4**	**2**	**2**	**3**	**5**	**4**	**7**	**3**	**9**

Note: The University of Western Ontario includes Lawson Health Research Institute and Robarts Research Institute.
McMaster University includes Hamilton Health Science and St. Joseph's Healthcare Hamilton.
The University of Calgary includes UTI incorporated.
- Not available or zero
* 2011 is the latest year for which information is available.
Source: Association of University Technology Managers

SIMON FRASER UNIVERSITY GROSS INCOME FROM TECHNOLOGY LICENSES (IN $ '000 CDN), U.S. PATENTS ISSUED AND START-UP COMPANIES FORMED*

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Technology License Income ('000)	263	736	86	152	343	183	299	338	1,523	1,527	1,382
US Patents Issued	3	4	4	3	10	2	2	-	2	-	5
Start-Up companies formed	6	2	4	3	1	-	3	3	-	2	-

- Not available or zero
* 2011 is the latest year for which information is available.
Source: Association of University Technology Managers

UNIVERSITY OF VICTORIA GROSS INCOME FROM TECHNOLOGY LICENSES (IN $ '000 CDN), U.S. PATENTS ISSUED AND START-UP COMPANIES FORMED*

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Technology License Income ('000)	-	-	130	148	124	89	154	208	258	479	533
US Patents Issued	-	-	-	4	3	5	3	1	2	5	7
Start-Up companies formed	-	-	-	-	2	1	7	6	1	-	3

- Not available or zero
* 2011 is the latest year for which information is available.
Source: Association of University Technology Managers

INDICATOR E-14. RATIO OF HIGHER EDUCATION PERFORMANCE OF R&D TO GDP (%)*

	2007	2008	2009	2010
CANADA	0.65	0.66	0.69	0.69
NL	0.47	0.46	0.61	0.58
PE	0.74	0.78	0.84	0.81
NS	0.97	0.97	0.98	1.02
NB	0.51	0.53	0.54	0.49
QC	0.85	0.89	0.83	0.86
ON	0.72	0.76	0.76	0.74
MB	0.61	0.60	0.64	0.66
SK	0.44	0.47	0.51	0.51
AB	0.39	0.38	0.48	0.46
BC	**0.55**	**0.56**	**0.59**	**0.62**

* 2010 is the latest year for which information is available. Consistent GDP data prior to 2007 are not available.
Source: Statistics Canada

INDICATOR E-15. RESEARCH GRANTS AND AWARDS FUNDED BY THE CANADIAN INSTITUTES OF HEALTH RESEARCH, UP TO FUNDING YEAR 2013/14

	# awarded	total $ amount	average $ amount	funding per capita
CANADA	36,804	10,491,992,185	285,077	$296
NL	348	59,566,949	171,169	$114
PE	64	7,630,682	119,229	$52
NS	1,080	255,943,575	236,985	$270
NB	141	14,928,181	105,874	$20
QC	10,253	3,010,492,250	293,621	$371
ON	14,578	4,317,443,567	296,162	$317
MB	1,117	272,112,040	243,610	$211
SK	676	139,014,069	205,642	$126
AB	3,548	1,042,645,160	293,868	$257
BC	**4,759**	**1,324,496,627**	**278,314**	**$279**

Notes: Grant and Award funding for funding year 2013/14 were approved in 2012/13.
Totals include cumulative funding from inception (2000) up to and including fiscal year 2013/14.
Canada total includes Territories.
Per capita is calculated using projected population as at July 1st, 2013.
Source: Canadian Institutes of Health Research

INDICATOR E-16 (A). HEALTH SCIENCE RESEARCH SECTOR PROJECTS FUNDED BY THE CANADIAN FOUNDATION FOR INNOVATION, UP TO FUNDING YEAR 2012/13

	# of projects	total $ amount	average $ amount	funding per capita
TOTAL	1,493	$1,414,021,829	$947,101	$41
NL	14	$12,805,104	$914,650	$25
PE	5	$349,309	$69,862	$2
NS	54	$12,578,791	$232,941	$13
NB	8	$1,110,879	$138,860	$1
QC	481	$359,235,741	$746,852	$45
ON	523	$688,746,347	$1,316,915	$51
MB	60	$19,700,665	$328,344	$16
SK	32	$36,210,282	$1,131,571	$34
AB	142	$122,533,645	$862,913	$32
BC	**174**	**$160,751,066**	**$923,857**	**$35**

Note: Total includes sum of provinces, cumulative funding since program onset (1997) up to and including fiscal year 2012/13.
Per Capita is calculated using population as at July 1st, 2012.
Source: Canadian Foundation for Innovation

INDICATOR E-16 (B). NATURAL SCIENCES AND ENGINEERING RESEARCH SECTOR PROJECTS FUNDED BY THE CANADIAN FOUNDATION FOR INNOVATION, UP TO 2012/13

	# of projects	total $ amount	average $ amount	funding per capita
TOTAL	5,616	$2,668,243,998	$475,115	$77
NL	99	$36,884,076	$372,566	$72
PE	22	$7,259,484	$329,977	$50
NS	276	$91,080,313	$330,001	$96
NB	128	$20,165,769	$157,545	$27
QC	1,320	$656,627,485	$497,445	$82
ON	2,129	$1,113,589,182	$523,057	$82
MB	197	$52,042,722	$264,176	$41
SK	238	$124,164,463	$521,699	$115
AB	523	$242,329,313	$463,345	$63
BC	**684**	**$324,101,192**	**$473,832**	**$70**

Note: Total includes sum of provinces, cumulative funding since program onset (1997) up to and including fiscal year 2012/13.
Per Capita is calculated using population as at July 1st, 2012.
Source: Canadian Foundation for Innovation

INDICATOR E-17. GRANT AND SCHOLARSHIP EXPENDITURES FUNDED BY THE NATIONAL SCIENCES AND ENGINEERING RESEARCH COUNCIL OF CANADA, 2005/06 TO 2010/11

	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	Funding per capita, 10/11
TOTAL	$640,346,365	$665,262,201	$732,540,041	$765,530,053	$782,060,774	$794,041,372	$23
NL	$7,632,372	$8,075,366	$8,996,368	$10,317,292	$10,702,571	$9,604,981	$19
PE	$1,001,674	$784,732	$831,686	$1,072,722	$1,135,411	$1,268,124	$9
NS	$21,616,731	$23,973,405	$23,936,724	$24,345,440	$23,039,594	$23,246,993	$25
NB	$10,569,753	$10,999,559	$11,046,898	$12,696,040	$14,103,119	$14,847,462	$20
QC	$157,904,720	$161,104,120	$172,625,124	$181,982,782	$189,041,069	$195,218,842	$25
ON	$244,559,647	$258,090,073	$284,145,661	$294,843,830	$302,272,879	$304,944,495	$23
MB	$15,536,899	$16,517,416	$19,304,977	$19,205,167	$18,469,663	$17,942,852	$15
SK	$27,862,491	$29,259,273	$33,440,635	$34,787,664	$38,222,999	$36,438,086	$35
AB	$65,638,934	$66,236,321	$71,829,578	$76,643,537	$76,751,384	$81,930,999	$22
BC	**$88,023,144**	**$90,221,938**	**$106,382,389**	**$109,635,579**	**$108,322,084**	**$108,598,538**	**$24**

Note: Total includes sum of provinces only.
Source: The National Sciences and Engineering Research Council of Canada

INDICATOR E-18. CANADA RESEARCH CHAIRS, PROVINCIAL DISTRIBUTION, 2013

	Total active Chairs	Chairholders from outside Canada	% female chairholders
TOTAL	1,769	307	26%
NL	15	1	33%
PE	5	2	40%
NS	62	14	29%
NB	27	4	30%
QC	488	87	22%
ON	674	106	27%
MB	56	6	29%
SK	41	5	27%
AB	157	21	28%
BC	**244**	**61**	**30%**

Note: Total includes sum of provinces only.
Source: Canada Research Chairs Program

12.2. Business Indicators

INDICATOR B-1. PATENTS AWARDED PER 100,000 POPULATION*

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
CANADA	4.01	3.86	4.07	4.57	4.64	5.18	5.51	5.47	6.20	5.80	6.72
NL	0.77	0.77	0.96	0.77	0.78	1.18	1.18	1.38	1.37	1.17	0.19
PE	0.73	0.73	0.73	0.73	2.17	0.00	1.45	1.43	0.71	0.00	0.00
NS	0.86	1.82	1.39	1.28	2.03	2.13	1.82	2.77	1.70	2.22	2.11
NB	1.33	1.33	2.00	1.73	1.34	1.34	1.34	1.61	1.73	1.73	1.19
QC	4.31	4.27	4.84	4.51	4.38	4.56	5.39	4.53	5.41	5.16	5.87
ON	4.49	4.05	3.89	4.79	4.68	5.72	5.90	6.05	6.79	6.68	8.15
MB	2.52	2.94	3.78	3.24	3.90	3.46	3.60	2.99	3.69	3.40	3.52
SK	2.70	2.61	2.51	4.91	6.14	6.15	4.20	4.64	3.89	5.94	3.78
AB	6.08	6.23	6.72	8.52	8.82	9.53	10.25	11.36	13.37	10.74	12.73
BC	**3.09**	**2.81**	**3.20**	**3.08**	**3.36**	**3.56**	**3.81**	**3.47**	**3.74**	**3.18**	**3.61**

* 2011 is the latest year for which information is available.
Source: Canadian Intellectual Property Office

INDICATOR B-2. PATENTS GRANTED AS A PERCENT OF PATENT APPLICATIONS*

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
CANADA	26	24	25	27	29	33	34	35	41	39	44
NL	25	20	24	19	20	29	38	32	39	27	7
PE	13	20	25	20	60	0	33	100	11	0	0
NS	14	29	22	24	31	38	40	33	25	30	26
NB	19	17	37	24	24	24	22	27	30	27	20
QC	22	22	27	23	24	26	32	30	37	36	40
ON	27	24	21	27	27	34	32	32	40	40	46
MB	28	31	47	37	36	35	29	41	38	34	42
SK	19	22	26	40	47	46	32	39	40	46	33
AB	32	33	30	35	38	47	46	52	64	47	56
BC	**26**	**20**	**23**	**22**	**26**	**28**	**31**	**30**	**28**	**28**	**38**

* 2011 is the latest year for which information is available.
Source: Canadian Intellectual Property Office

INDICATORS B-3, B-4 AND B-5. NUMBER OF ESTABLISHMENTS, ENTRIES, EXITS AND HIGH GROWTH COMPANIES

TOTAL B.C. ECONOMY

	2007	2008	2009	2010	2011	2012
Establishments	172,372	175,003	176,124	175,913	173,589	175,886
Entries		19,628	20,784	18,197	16,382	22,407
Exits		16,997	19,663	18,408	18,706	20,110
High Growth Companies		980	958	1,041	1,031	1,004

HIGH TECHNOLOGY SECTOR

	2007	2008	2009	2010	2011	2012
Establishments	8,644	8,832	8,903	8,885	8,757	9,010
Entries		1,311	1,307	1,196	1,113	1,682
Exits		1,123	1,236	1,214	1,241	1,429
High Growth Companies		50	46	41	64	45

Source: BC Stats

INDICATOR B-6. CANADIAN VENTURE CAPITAL INVESTMENT BY PROVINCE OF INVESTMENT ($ MILLIONS)*

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
CANADA	3,800	2,529	1,674	1,839	1,678	1,695	2,079	1,380	1,010	1,129	1,510
ATLANTIC	49	34	55	37	36	32	34	45	68	21	70
QC	984	720	621	620	552	603	646	393	431	372	549
ON	2,107	1,304	760	844	755	686	948	580	288	426	550
MB	44	34	28	23	11	25	18	3	10	14	25
SK	14	48	23	36	29	17	59	21	13	9	16
AB	88	87	77	26	65	34	58	78	59	67	74
BC	**514**	**302**	**110**	**253**	**230**	**298**	**316**	**260**	**141**	**220**	**226**

* 2011 is the latest year for which information is available.
Source: Canadian Venture Capital Association

INDICATOR B-7. PROPORTIONAL SHARE OF CANADIAN VENTURE CAPITAL INVESTMENT (%)*

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
ATLANTIC	1.3	1.3	3.3	2.0	2.1	1.9	1.6	3.3	6.7	1.9	4.6
QC	25.9	28.5	37.1	33.7	32.9	35.6	31.1	28.5	42.7	33.0	36.3
ON	55.4	51.6	45.4	45.9	45.0	40.5	45.6	42.1	28.5	37.8	36.4
MB	1.2	1.3	1.7	1.3	0.7	1.5	0.9	0.2	1.0	1.2	1.6
SK	0.4	1.9	1.4	2.0	1.7	1.0	2.8	1.5	1.3	0.8	1.1
AB	2.3	3.4	4.6	1.4	3.9	2.0	2.8	5.7	5.9	5.9	4.9
BC	**13.5**	**11.9**	**6.6**	**13.8**	**13.7**	**17.6**	**15.2**	**18.8**	**13.9**	**19.5**	**15.0**

* 2011 is the latest year for which information is available.
Source: Canadian Venture Capital Association

CANADIAN VENTURE CAPITAL INVESTMENT PER CAPITA ($)*

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
CANADA	122.51	80.66	52.91	57.54	52.01	51.97	63.15	41.41	29.93	33.09	43.80
ATLANTIC	20.93	14.53	23.48	15.79	15.40	13.72	14.60	19.32	29.01	9.05	29.54
QC	133.04	96.76	82.96	82.27	72.80	79.01	84.10	50.68	55.11	47.08	68.80
ON	177.11	107.85	62.08	68.12	60.26	54.16	74.11	44.88	22.01	32.24	41.18
MB	38.21	29.40	24.06	19.60	9.34	21.11	15.50	2.59	7.88	11.02	19.69
SK	14.00	48.15	23.08	36.09	29.19	17.13	59.14	20.39	12.84	8.57	15.47
AB	28.78	27.81	24.19	8.03	19.57	9.94	16.41	21.71	16.11	17.94	19.51
BC	**126.10**	**73.69**	**26.68**	**60.89**	**54.80**	**70.22**	**73.26**	**59.25**	**31.55**	**48.60**	**49.49**

* 2011 is the latest year for which information is available.
Source: Canadian Venture Capital Association

INDICATOR B-8. RATIO OF BUSINESS PERFORMANCE OF R&D TO GDP (%)*

	2007	2008	2009	2010
CANADA	1.07	1.01	0.99	0.91
NL	0.30	0.29	0.36	0.25
PE	0.28	0.31	0.22	0.19
NS	0.31	0.30	0.30	0.23
NB	0.44	0.42	0.42	0.33
QC	1.59	1.53	1.48	1.42
ON	1.35	1.30	1.20	1.09
MB	0.42	0.35	0.41	0.39
SK	0.37	0.22	0.25	0.23
AB	0.56	0.55	0.61	0.51
BC	**0.82**	**0.83**	**0.83**	**0.78**

* 2010 is the latest year for which information is available. Consistent GDP data prior to 2007 are not available.
Source: Statistics Canada

TOTAL INTRAMURAL RESEARCH AND DEVELOPMENT EXPENDITURES BY PROVINCE, BY INDUSTRY, 2008 ($ MILLIONS)*

	ATLANTIC	QC	ON	MB	SK	AB	BC	Total
Agriculture, Forestry, Fishing, Hunting	7	x	40	3	x	5	10	106
Mining and Oil & Gas Extraction	x	x	x	x	x	692	258	1,035
Utilities	x	x	45	x	x	x	3	184
Construction	x	x	64	2	0	x	5	120
Manufacturing	194	2,149	4,123	92	47	360	335	7,300
Pharmaceutical & Medicine	20	180	443	x	1	x	43	738
Computer & Peripheral Equipment	x	17	56	x	0	23	7	102
Communications Equipment	x	82	1,337	x	0	18	14	1,466
Semiconductor & Other Electronic Components	4	78	289	x	x	x	70	448
Navigational, Measuring, Medical & Control Instruments	4	160	192	3	1	6	39	406
Other Computer & Electronic Products	x	x	x	0	0	x	5	19
Aerospace Products & Parts	x	682	303	x	0	x	0	990
Services	108	2,241	3,279	60	46	380	934	7,048
Information & Cultural Industries	34	314	634	2	6	29	245	1,264
Computer System Design & Related	22	350	583	10	4	89	135	1,193
Scientific Research & Development	13	674	502	11	3	57	302	1,561
TOTAL	317	4,595	7,564	160	132	1,479	1,545	15,792

*2008 is the latest year for which information is available.
x denotes data suppression. Numbers may not add due to rounding.
Total includes Yukon, Northwest Territories and Nunavut.
Source: Statistics Canada

12.3. Government Indicators

INDICATOR G-1. INDEX OF ALL TAXES PAID BY UNATTACHED INDIVIDUALS EARNING $80,000 PER YEAR ($)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
NL	28,662	28,169	28,281	29,120	28,687	26,449	24,991	24,929	24,539	24,188	24,064
PE	26,299	25,855	25,938	26,427	25,956	24,921	24,133	24,448	24,406	24,320	24,397
NS	26,685	26,189	26,301	27,479	27,453	25,340	25,690	25,742	26,088	25,890	25,877
NB	25,558	25,010	25,115	25,377	25,482	24,897	23,506	23,177	22,997	22,778	22,670
QC	33,147	32,691	32,741	33,779	33,024	30,880	30,951	30,986	31,179	31,282	31,455
ON	25,688	25,667	25,667	25,943	25,369	24,742	24,506	24,687	24,701	24,259	24,125
MB	29,863	28,127	28,127	27,112	26,437	25,787	26,360	26,321	26,306	26,000	26,027
SK	25,124	24,711	24,825	26,041	25,952	23,212	23,302	23,472	23,289	22,951	22,815
AB	22,895	22,334	22,212	21,710	21,272	20,350	19,885	19,949	19,966	19,837	19,777
BC	**22,892**	**22,261**	**22,063**	**21,497**	**20,731**	**19,961**	**19,553**	**19,952**	**19,990**	**19,741**	**19,512**

Source: B.C. Ministry of Finance

INDICATOR G-2. SMALL BUSINESS TAX RATE

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
NL	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0
PE	7.5	7.5	7.5	7.5	5.4	4.3	2.1	1.0	1.0	1.0	1.0
NS	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.0	3.5
NB	3.0	3.0	2.5	2.0	1.0	5.0	5.0	5.0	5.0	4.5	4.5
QC	9.0	8.9	8.9	8.9	8.0	8.0	8.0	8.0	8.0	8.0	8.0
ON	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	4.5	4.5	4.5
MB	5.0	5.0	5.0	4.5	3.0	2.0	1.0	0.0	0.0	0.0	0.0
SK	6.0	5.5	5.0	5.0	4.5	4.5	4.5	4.5	4.5	2.0	2.0
AB	4.5	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
BC	**4.5**	**4.5**	**4.5**	**4.5**	**4.5**	**4.5**	**2.5**	**2.5**	**2.5**	**2.5**	2.5

Source: B.C. Ministry of Finance

INDICATOR G-3. GENERAL CORPORATE INCOME TAX RATE

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
NL	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
PE	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
NS	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
NB	13.0	13.0	13.0	13.0	12.0	13.0	12.0	12.0	11.0	10.0	10.0
QC	9.0	8.9	8.9	8.9	9.9	11.4	11.4	11.9	11.9	11.9	11.9
ON	12.5	14.0	14.0	14.0	14.0	14.0	14.0	14.0	12.0	11.5	11.5
MB	16.0	15.5	15.0	15.0	14.0	14.0	12.0	12.0	12.0	12.0	12.0
SK	17.0	17.0	17.0	17.0	13.0	13.0	12.0	12.0	12.0	12.0	12.0
AB	13.0	12.5	11.5	11.5	10.0	10.0	10.0	10.0	10.0	10.0	10.0
BC	**13.5**	**13.5**	**13.5**	**12.0**	**12.0**	**12.0**	**11.0**	**10.5**	**10.0**	**10.0**	**10.0**

Source: B.C. Ministry of Finance

INDICATOR G-4. COMBINED FEDERAL AND PROVINCIAL PERFORMANCE OF R&D AS A % OF GDP*

	2007	2008	2009	2010
CANADA	0.19	0.18	0.20	0.20
NL	0.11	0.08	0.10	0.08
PE	0.28	0.29	0.31	0.27
NS	0.23	0.22	0.19	0.19
NB	0.21	0.17	0.17	0.12
QC	0.16	0.16	0.15	0.13
ON	0.27	0.29	0.32	0.36
MB	0.18	0.18	0.24	0.22
SK	0.15	0.12	0.20	0.16
AB	0.10	0.09	0.10	0.08
BC	**0.07**	**0.06**	**0.07**	**0.05**

* 2010 is the latest year for which information is available. Consistent GDP data prior to 2007 are not available.
Source: Statistics Canada

INDICATOR G-5. TOTAL EXPENDITURES (PRIVATE AND PUBLIC SECTOR) ON R&D AS A % OF GDP*

	2007	2008	2009	2010
CANADA	1.92	1.87	1.90	1.80
NL	0.88	0.82	1.07	0.91
PE	1.30	1.39	1.39	1.30
NS	1.50	1.49	1.47	1.44
NB	1.16	1.12	1.14	0.95
QC	2.60	2.57	2.45	2.41
ON	2.35	2.35	2.28	2.18
MB	1.22	1.13	1.29	1.27
SK	0.97	0.80	0.96	0.90
AB	1.05	1.02	1.19	1.05
BC	**1.44**	**1.45**	**1.49**	**1.45**

* 2010 is the latest year for which information is available. Consistent GDP data prior to 2007 are not available.
Source: Statistics Canada

PROFILE OF THE B.C. TOTAL EXPENDITURES ON R&D ($ MILLION)*

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Business Enterprise	973	1,079	1,093	1,171	1,324	1,402	1,364	1,616	1,685	1,628	1,617
Higher Education & Private Non-Profit	497	562	736	785	832	904	959	1,083	1,136	1,151	1,297
Federal Govt	111	97	99	80	91	91	91	108	93	115	93
Provincial Government & Research Institutions	25	22	20	15	16	18	18	30	33	25	19

* 2010 is the latest year for which information is available.
Source: Statistics Canada

12.4. External Indicators

INDICATOR X-1. PERCENTAGE OF IMMIGRANTS AGED 25 YEARS AND OLDER WITH 16 OR MORE YEARS OF EDUCATION

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
CANADA	45.0	44.6	47.1	46.7	44.8	44.8	46.2	44.0	45.8	41.2	34.6
NL	45.0	47.2	45.9	45.7	52.9	47.1	52.5	57.6	53.6	46.5	28.9
PE	27.1	38.1	52.8	51.3	40.3	36.3	37.6	33.5	31.7	36.9	29.9
NS	51.2	53.6	57.9	57.1	54.1	50.4	57.7	51.5	52.8	44.5	36.4
NB	49.5	45.2	50.2	52.3	55.8	49.4	52.8	50.0	46.9	40.4	38.3
QC	49.6	51.9	53.0	52.9	51.8	54.1	55.3	53.2	53.8	46.4	36.8
ON	45.8	44.3	46.9	46.4	43.3	42.9	44.7	43.1	46.5	42.7	37.1
MB	31.2	27.7	29.4	29.2	26.9	25.1	28.2	25.6	27.2	27.3	26.6
SK	40.4	43.0	48.0	43.5	41.7	32.9	32.5	28.6	30.8	29.8	23.3
AB	41.1	38.6	43.5	43.8	44.3	42.9	44.5	43.3	42.0	37.4	30.4
BC	**40.4**	**42.5**	**44.6**	**45.2**	**44.4**	**45.3**	**45.7**	**42.6**	**45.2**	**41.1**	**34.1**

Source: Citizenship and Immigration Canada

INDICATOR X-2. MEDIAN YEARS OF SCHOOLING OF IMMIGRANTS AGED 25 YEARS AND OLDER

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
CANADA	15.1	15.1	15.3	15.2	15.0	15.0	15.1	14.9	15.1	14.6	13.6
NL	14.8	15.0	15.1	15.0	15.7	15.0	15.7	16.1	15.8	15.1	12.0
PE	12.5	14.2	15.6	15.6	14.6	14.2	14.5	14.1	14.4	14.7	13.7
NS	15.6	15.7	15.9	15.9	15.7	15.5	15.9	15.6	15.7	14.7	13.2
NB	15.4	15.0	15.5	15.6	15.7	15.4	15.6	15.5	15.1	14.3	13.8
QC	15.5	15.6	15.7	15.7	15.6	15.8	15.9	15.7	15.7	15.1	13.5
ON	15.2	15.1	15.3	15.2	14.9	14.8	15.0	14.8	15.2	14.7	13.8
MB	13.8	13.3	13.8	13.8	13.8	13.8	13.8	13.7	13.9	13.9	13.4
SK	14.4	14.7	15.3	14.8	14.3	13.8	13.9	13.7	14.0	14.0	12.0
AB	14.8	14.7	15.0	15.1	15.0	14.9	15.0	14.9	14.8	14.4	13.6
BC	**14.8**	**15.0**	**15.1**	**15.2**	**15.0**	**15.1**	**15.1**	**14.8**	**15.1**	**14.6**	**13.5**

Source: Citizenship and Immigration Canada

INDICATOR X-3. NET INTER-PROVINCIAL MIGRATION (NUMBER OF PERSONS) *

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
NL	-3,352	-1,683	-2,027	-3,710	-4,342	-4,067	-528	1,877	1,558	30	-1,556
PE	62	165	144	-139	-639	-849	-291	-536	60	-210	-1,252
NS	-898	510	-772	-3,041	-3,024	-4,126	-1,794	-751	612	-41	-3,008
NB	-1,218	-843	-760	-2,074	-3,487	-2,632	-908	-237	571	-158	-2,182
QC	-4,350	-1,829	-822	-4,963	-9,411	-12,865	-11,682	-7,419	-3,258	-4,763	-3,886
ON	5,354	637	-6,935	-11,172	-17,501	-20,047	-14,750	-15,601	-4,662	-4,007	-8,091
MB	-4,344	-2,875	-2,565	-7,227	-7,881	-5,500	-3,703	-3,111	-2,412	-3,517	-4,675
SK	-8,820	-5,141	-4,521	-9,515	-7,083	1,549	4,171	2,983	2,153	545	2,846
AB	26,235	11,903	10,606	34,423	45,795	33,809	15,317	13,184	-3,271	8,443	28,170
BC	**-8,556**	**-1,037**	**7,865**	**8,214**	**8,800**	**15,005**	**14,643**	**9,995**	**8,728**	**3,421**	**-4,648**

* Dates for this indicator are in Census years, such that '2012' refers to the July 1st, 2011 to June 30th, 2012 period.

Source: Statistics Canada

INDICATOR X-4. VALUE OF HIGH TECHNOLOGY IMPORTS TO B.C. BY COMMODITY TYPE ($ MILLION)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Biotechnology	53.3	46.8	34.3	35.3	43.8	59.9	84.9	102.7	125.8	143.4	153.9
Life Sciences	482.8	462.8	455.6	475.2	496.7	506.0	603.5	596.5	633.7	615.6	667.2
Opto-Electronics	117.1	106.3	123.5	205.1	299.6	337.9	403.7	289.7	337.0	313.4	271.5
Computers & Telecommunications	2,148.1	2,254.7	2,394.1	2,425.3	2,359.8	2,750.2	2,816.7	2,348.7	2,695.5	2,967.2	2,951.0
Electronics	194.1	173.9	140.5	245.6	253.2	253.6	278.3	290.1	308.6	306.6	270.0
Computer Integrated Manufacturing	191.2	205.2	188.5	181.8	195.8	159.6	149.2	138.9	154.0	189.5	236.7
Material Design	27.8	20.0	26.6	17.1	24.3	18.0	29.1	25.3	31.2	42.2	44.5
Aerospace	800.0	449.4	361.5	590.9	385.3	537.2	588.4	445.8	373.3	379.4	409.1
Weapons and Nuclear	31.9	31.7	39.5	15.3	19.7	16.8	18.4	18.9	18.1	23.5	20.6
Total	**4,046.4**	**3,750.7**	**3,764.1**	**4,191.7**	**4,078.2**	**4,639.3**	**4,971.9**	**4,256.5**	**4,677.2**	**4,980.9**	**5,024.2**

Source: BC Stats

12.5. Labour Indicators

INDICATOR L-1. UNEMPLOYMENT RATE FOR NATURAL AND APPLIED SCIENCE OCCUPATIONS (%)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
CANADA	4.5	4.5	3.8	2.9	2.6	3.0	2.9	4.6	3.6	3.0	3.3
NL	7.7	9.2	6.7	9.5	5.1	5.8	8.0	6.0	6.4	5.1	5.5
PE	5.4	8.1	11.4	5.0	4.4	5.1	5.9	5.9	4.7	6.8	6.5
NS	5.8	7.3	4.2	5.0	4.5	3.1	3.3	5.5	5.0	5.0	4.6
NB	4.7	5.4	4.2	5.5	4.4	2.8	3.7	3.5	3.7	2.8	5.2
QC	4.4	4.8	4.5	3.5	3.7	3.0	3.7	4.5	3.5	2.6	3.1
ON	4.8	3.9	3.3	2.7	2.2	3.5	3.1	4.9	3.7	3.3	3.4
MB	3.2	3.1	1.9	-	2.5	1.8	1.7	2.4	3.0	1.7	2.4
SK	2.7	4.6	-	-	2.2	-	2.2	2.3	2.4	1.9	2.9
AB	3.0	3.2	3.5	1.6	1.8	2.0	1.5	4.3	3.7	2.4	2.5
BC	**5.1**	**6.1**	**4.9**	**2.9**	**2.3**	**2.3**	**2.0**	**5.2**	**3.6**	**2.7**	**3.8**

- Data not available

Source: Statistics Canada

INDICATOR L-2. FTE RESEARCH WORKFORCE PER 100,000 POPULATION, 2009 AND 2010*

	Federal		Provincial		Business		Higher Education		Total	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
CANADA	51	50	9	8	456	399	178	187	698	649
NL	37	35	0	0	139	117	191	205	365	358
PE	78	70	0	21	156	119	106	119	333	322
NS	52	57	0	0	164	116	211	229	425	402
NB	44	41	23	4	177	146	151	166	395	359
QC	33	31	11	12	632	576	214	205	891	824
ON	82	80	4	4	533	474	181	194	800	752
MB	59	60	9	9	182	160	153	187	403	416
SK	50	48	20	19	157	138	152	165	378	370
AB	22	23	22	21	260	203	170	183	473	430
BC	**17**	**16**	**5**	**4**	**390**	**308**	**159**	**176**	**571**	**503**

FTE: full time equivalent position
* 2010 is the latest year for which information is available.
Source: Statistics Canada

STRUCTURE OF THE RESEARCH WORKFORCE BY SECTOR IN 2010 (%)*

	Federal	Provincial	Business	Higher education	Total FTE
QC	3.8	1.4	69.9	24.9	65,160
ON	10.7	0.5	63.0	25.7	99,490
MB	14.4	2.1	38.5	44.9	5,140
AB	5.4	5.0	47.2	42.4	16,030
BC	**3.1**	**0.7**	**61.1**	**35.0**	**22,800**

FTE: full time equivalent position
*2010 is the latest year for which information is available.
Source: Statistics Canada

INDICATOR L-3. QUALITY OF LIFE INDEX SCORES, 2012 (NEW YORK = 100)

	Global Rank	Americas Rank
Vancouver	5	1
Ottawa	14	2
Toronto	15	3
Montreal	23	4
Honolulu	28	5
San Francisco	29	6
Calgary	32	7
Seattle	44	12

Source: Mercer Human Resource Consulting

INDICATOR L-4. ALL ITEMS INTER-CITY RETAIL PRICE INDEX (UNITS)*

	Oct-01	Oct-02	Oct-03	Oct-04	Oct-05	Oct-06	Oct-07	Oct-08	Oct-09	Oct-10	Oct-11
Winnipeg	92	91	91	92	92	92	94	94	94	93	93
Montreal	94	95	93	93	93	93	95	95	95	95	93
Edmonton	93	95	97	97	97	97	98	101	102	99	99
Ottawa	104	105	103	103	103	102	102	103	103	103	102
Vancouver	**106**	**105**	**103**	**102**	**102**	**104**	**103**	**101**	**101**	**103**	**105**
Toronto	110	110	110	110	110	109	107	107	107	107	107

*2011 is the latest year for which information is available.
Note: This index measures only the price differences for a specific basket of goods, which may or may not be representative of the overall cost of living for each specific city.
Source: Statistics Canada

12.6. Post-Secondary Outcomes

DACSO SURVEY: ELIGIBLE PARTICIPANTS AND RESPONSE RATES FOR PROGRAM AREA GRADUATES

Program	Eligible Graduates	Graduate Respondents	Response Rate
High Tech Program	**8,508**	**5,372**	**63%**
Physical and Life Sciences	229	160	70%
Computer and Information Sciences	1,723	1,098	64%
Engineering and Related Technologie	3,617	2,419	67%
Health and Clinical Sciences	2,939	1,695	58%
Non-High Tech Program	**49,178**	**29,355**	**60%**
Total	**57,686**	**34,727**	**60%**

Source: BC Student Outcomes, DACSO Survey

BGS SURVEY: ELIGIBLE PARTICIPANTS AND RESPONSE RATES FOR PROGRAM AREA GRADUATES

Program	Eligible Graduates	Graduate Respondents	Response Rate
High Tech Program	**9,831**	**5,231**	**53%**
Physical and Life Sciences	5,202	2,756	53%
Computer and Information Sciences	1,832	992	54%
Engineering and Related Technologie	2,797	1,483	53%
Non-High Tech Program	**44,731**	**23,196**	**52%**
Total	**54,562**	**28,427**	**52%**

Source: BC Student Outcomes, Baccalaureate Graduates Survey

DACSO HIGH TECHNOLOGY PROGRAMS

High Technology Programs	Percent of Graduates
Engineering Technologies/Technicians	45%
Health Professions and Related Clinical Sciences	37%
Computer and Information Sciences and Support Services	19%
Science Technologies/Technicians	2%
Library Science	2%
Other	1%

Note: N = 5,372
Source: BC Student Outcomes, DACSO Survey

BGS HIGH TECHNOLOGY PROGRAMS

High Technology Programs	Percent of Graduates
Biological and Biomedical Sciences	42%
Engineering	24%
Computer and Information Sciences and Support Services	15%
Physical Sciences	11%
Engineering Technologies/Technicians	5%
Mathematics and Statistics	4%
Multi/Interdisciplinary Studies	0.1%

Note: N = 5,231
Source: BC Student Outcomes, Baccalaureate Graduates Survey

INDICATORS O-1, O-2, O-3 AND O-4 (A). EDUCATIONAL CHARACTERISTICS OF DACSO GRADUATES OF HIGH TECHNOLOGY PROGRAMS

Characteristics	Physical & Life Sciences	Computer & Information Sciences	Engineering & Related Technologies	Health & Clinical Sciences
Satisfaction with education	94%	92%	92%	92%
Quality of instruction	96%	95%	94%	94%
Further studies since graduation	65%	30%	37%	24%
Current activity:				
Studying	30%	7%	18%	2%
Studying and working	31%	15%	13%	16%
Working	33%	66%	58%	77%
Neither studying nor working	6%	12%	11%	5%

Note: In the DACSO Survey, respondents were asked to rate quality of instruction using a 5 point scale: very good, good, adequate, poor, and very poor. Percentages presented for DACSO quality of instruction include the response categories: very good, good, and adequate.
Source: BC Student Outcomes, DACSO Survey

INDICATORS O-1, O-2, O3 AND O-4 (B). EDUCATIONAL CHARACTERISTICS OF BACCALAUREATE GRADUATES OF HIGH TECHNOLOGY PROGRAMS

Characteristics	Physical & Life Sciences	Computer & Information Sciences	Engineering& Related Technologies
Satisfaction with education	92%	92%	93%
Quality of instruction	93%	91%	92%
Further studies since graduation	74%	45%	37%
Current activity:			
Studying	39%	10%	12%
Studying and working	21%	16%	12%
Working	33%	66%	70%
Neither studying nor working	6%	8%	6%

Note: In the BGS Survey, respondents were asked to rate quality of instruction using a 4 point scale: very good, good, poor, and very poor. Percentages presented for BGS quality of instruction include two response categories: very good and good.
Source: BC Student Outcomes, Baccalaureate Graduates Survey

INDICATORS O-5, O-6, O-7, O-8 AND O-9 (A). LABOUR FORCE CHARACTERISTICS OF DACSO GRADUATES OF HIGH TECHNOLOGY PROGRAMS

Characteristics	Physical & Life Sciences	Computer & Information Sciences	Engineering& Related Technologies	Health & Clinical Sciences
In the labour force	73%	93%	82%	97%
Employment rate	65%	81%	71%	93%
Unemployment rate	9%	12%	13%	4%
Job related to training*	70%	73%	77%	91%
Knowledge, skills, & abilities useful in job*	72%	81%	81%	92%

* Of those respondents who indicated they were employed.
Source: BC Student Outcomes, DACSO Survey

INDICATORS O-5, O-6, O-7, O-8 AND O-9 (B). LABOUR FORCE CHARACTERISTICS OF BACCALAUREATE GRADUATES OF HIGH TECHNOLOGY PROGRAMS

Characteristics	Physical & Life Sciences	Computer & Information Sciences	Engineering& Related Technologies
In the labour force	67%	92%	91%
Employment rate	58%	85%	84%
Unemployment rate	14%	8%	8%
Job related to training*	53%	79%	84%
Knowledge, skills, & abilities useful in job	72%	84%	87%

* Of those respondents who indicated they were employed.
Source: BC Student Outcomes, Baccalaureate Graduates Survey

INDICATOR O-10 (A). TOP FIVE OCCUPATIONS OF DACSO GRADUATES OF HIGH TECHNOLOGY PROGRAMS

	High Technology Program			
Top 5 Occupations	Physical & Life Sciences	Computer & Information Sciences	Engineering & Related Technologies	Health & Clinical Sciences
1	Technical Occs. in Physical Sciences - 41%	Tech. Occs. in Computer & Info Systems - 26%	Tech. Occs. in Arch. Draft. Survey. & Map - 18%	Med. Technologists & Tech. (Exc. Dental) - 58%
2	Technical Occupations in Life Sciences - 11%	Computer and Info. Systems Professionals - 22%	Tech. Occs. in Civil, Mech. & Ind. Eng. - 15%	Assisting Occs. in Support of Health Srv. - 18%
3	Occupations in Food and Beverage Service - 6%	Creative Designers and Craftpersons - 9%	Tech. Occs. in Electr. & Electrical Eng. – 9%	Other Tech. Occs. in Health (Exc. Dental) - 14%
4	University Professors and Assistants - 6%	Tech. Occs. in Libraries, Archives, etc. - 4%	Computer and Info. Systems Professionals - 8%	Athletes, Coaches, Referees & Rel. Occs. - 1%
5	Physical Science Professionals - 5%	Library, Correspondence & Info. Clerks - 4%	Tech. Occs. in Computer and Info. Systems – 5%	Food Counter Attendants & Kitchen Helpers - 1%

Source: BC Student Outcomes, DACSO Survey

INDICATOR O-10 (B). TOP FIVE OCCUPATIONS OF BACCALAUREATE GRADUATES OF HIGH TECHNOLOGY PROGRAMS

	High Technology Program		
Top 5 Occupations	Physical & Life Sciences	Computer & Information Sciences	Engineering& Related Technologies
1	University Professors and Assistants - 9%	Computer and Info. Systems Professionals - 52%	Civil, Mech., Elec. & Chemical Engs. - 43%
2	Sec. & Elem. School Teachers & Counsellors - 7%	Tech. Occs. in Computer & Info Systems - 9%	Computer and Info. Systems Professionals - 16%
3	Technical Occupations in Life Sciences - 6%	University Professors and Assistants - 4%	Other Engineers - 12%
4	Policy & Prog. Off., Researchers & Cons. - 6%	Sec.& Elem. School Teachers & Counsellors - 3%	Tech. Occs. in Arch. Draft. Survey. & Map - 2%
5	Technical Occs. in Physical Sciences - 5%	Creative Designers and Craftpersons - 3%	Mgrs in Eng., Arch., Science & Info. Sys. - 2%

Source: BC Student Outcomes, Baccalaureate Graduates Survey

INDICATORS O-11, O-12 AND O-13 (A). LABOUR FORCE CHARACTERISTICS OF DACSO GRADUATES EMPLOYED IN HIGH TECHNOLOGY OCCUPATIONS

Characteristics	Employed in High Technology Occupations	Not Employed in High Technology Occupations
Job related to training*	92%	75%
Paid worker*	95%	95%
Full-time employment*	84%	74%

* Of those respondents who indicated they were employed.
Source: BC Student Outcomes, DACSO Survey

INDICATORS O-11, O-12 AND O-13 (B). LABOUR FORCE CHARACTERISTICS OF BACCALAUREATE GRADUATES EMPLOYED IN HIGH TECHNOLOGY OCCUPATIONS

Characteristics	Employed in High Technology Occupations	Not Employed in High Technology Occupations
Job related to training*	86%	72%
Paid worker*	95%	95%
Full-time employment*	95%	82%

* Of those respondents who indicated they were employed.
Note: In the DACSO Survey, respondents were asked if they were paid workers or self-employed. In the BGS Survey, respondents were asked if they were paid workers, self-employed, or both a paid worker and self-employed. Percentages presented for the BGS Survey represent the percentage of respondents who indicated they were solely a paid worker and those who indicated they were both a paid worker and self-employed.
Source: BC Student Outcomes, Baccalaureate Graduates Survey

INDICATOR O-14 (A). INCOME FOR DACSO GRADUATES EMPLOYED IN HIGH TECHNOLOGY OCCUPATIONS

	Median Hourly Wage
Not employed in High Technology Occupations	$19
Employed in High Technology Occupations	$24
Top 3 High Technology Occupations:	
Medical Technologists and Technicians (excl. Dental)	$26
Computer and Information Systems Professionals	$23
Technical Occupations in Electronics and Electrical Engineering	$22

Note: Results presented are for those graduates who were employed at the time they were surveyed.
Source: BC Student Outcomes, DACSO Survey

INDICATOR O-14 (B). INCOME FOR BACCALAUREATE GRADUATES EMPLOYED IN HIGH TECHNOLOGY OCCUPATIONS

	Median Annual Income
Not employed in High Technology Occupations	$44,000
Employed in High Technology Occupations	$55,000
Top 3 High Technology Occupations:	
Computer and Information Systems Professionals	$56,000
Civil, Mechanical, Electrical, and Chemical Engineers	$64,000
Technical Occupations in Physical Sciences	$40,000

Note: Results presented are for those graduates who were employed at the time they were surveyed.
Source: BC Student Outcomes, Baccalaureate Graduates Survey

12.7. Reference Tables

REFERENCE TABLE 1. TOTAL POPULATION

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
CANADA	31,353,656	31,639,670	31,940,676	32,245,209	32,576,074	32,927,517	33,317,662	33,726,915	34,126,547	34,483,975	34,880,491
NL	519,531	518,520	517,447	514,363	510,313	506,330	506,352	509,095	511,872	512,900	512,659
PE	136,876	137,221	137,674	138,055	137,920	138,142	139,548	141,054	143,077	145,695	146,105
NS	935,015	937,491	939,376	937,941	938,010	935,983	937,472	940,565	945,152	948,458	948,695
NB	749,331	749,389	749,369	747,960	745,674	745,398	746,910	749,945	752,892	755,335	755,950
QC	7,441,076	7,485,838	7,535,929	7,581,911	7,631,552	7,687,063	7,750,518	7,825,803	7,905,087	7,977,989	8,054,756
ON	12,091,029	12,242,273	12,390,599	12,528,480	12,665,346	12,791,032	12,932,480	13,068,845	13,223,789	13,366,294	13,505,900
MB	1,156,613	1,163,819	1,173,566	1,178,301	1,184,031	1,193,601	1,205,691	1,219,904	1,235,723	1,251,690	1,267,003
SK	996,801	996,483	997,447	993,579	992,122	1,000,171	1,013,784	1,029,499	1,044,363	1,057,804	1,079,958
AB	3,128,364	3,183,396	3,239,471	3,322,200	3,421,253	3,512,897	3,592,191	3,672,728	3,723,756	3,778,072	3,873,745
BC	**4,098,178**	**4,122,396**	**4,155,170**	**4,196,788**	**4,243,580**	**4,309,524**	**4,384,310**	**4,459,900**	**4,529,508**	**4,576,577**	**4,622,573**

Source: Statistics Canada

REFERENCE TABLE 2. POPULATION AGED 15 YEARS AND OLDER

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
CANADA	25,523,673	25,843,944	26,186,016	26,546,604	26,924,276	27,307,848	27,706,724	28,112,267	28,505,237	28,849,069	29,217,328
NL	432,487	433,495	434,383	433,970	432,353	429,734	430,154	432,738	435,648	436,886	436,938
PE	110,826	111,647	112,593	113,535	114,053	114,723	116,238	117,720	119,829	122,417	123,148
NS	771,818	777,338	782,624	785,685	789,857	790,643	794,128	798,837	804,675	809,585	811,306
NB	620,177	622,374	624,505	625,926	626,778	628,221	631,073	634,939	638,630	641,624	642,744
QC	6,141,913	6,192,837	6,251,510	6,313,925	6,381,499	6,449,209	6,518,045	6,591,773	6,667,973	6,735,278	6,802,643
ON	9,779,713	9,939,993	10,100,743	10,257,338	10,410,702	10,555,111	10,707,273	10,853,153	11,016,164	11,163,956	11,305,642
MB	920,172	928,627	939,487	947,240	955,385	965,165	976,392	989,218	1,003,276	1,016,774	1,029,343
SK	790,991	794,199	798,721	799,867	801,906	809,572	821,040	834,258	846,166	856,739	873,881
AB	2,498,737	2,552,626	2,608,108	2,685,895	2,775,553	2,860,608	2,931,629	3,002,565	3,044,682	3,088,021	3,166,176
BC	**3,383,179**	**3,415,051**	**3,455,602**	**3,504,147**	**3,555,948**	**3,623,349**	**3,698,131**	**3,773,290**	**3,842,775**	**3,890,741**	**3,938,472**

Source: Statistics Canada

REFERENCE TABLE 3. POPULATION OF IMMIGRANTS AGED 25 YEARS OR OLDER

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
CANADA	148,899	144,024	151,624	166,720	162,348	153,404	162,324	167,321	185,657	165,070	176,024
NL	242	231	344	304	329	325	438	410	506	482	516
PE	70	97	178	189	335	568	864	1,046	1,588	1,071	672
NS	865	890	1,110	1,176	1,621	1,597	1,753	1,548	1,575	1,427	1,600
NB	430	414	516	642	997	1,018	1,142	1,203	1,336	1,226	1,373
QC	25,018	26,427	29,428	28,768	29,567	30,420	30,631	34,137	37,066	35,187	37,664
ON	86,374	77,638	79,721	88,547	80,594	71,608	72,732	70,976	78,167	65,974	68,179
MB	2,603	3,630	4,058	4,390	5,603	6,210	6,493	7,913	9,298	9,544	8,354
SK	952	942	1,142	1,223	1,609	2,085	2,810	4,073	4,618	5,416	6,969
AB	9,559	10,223	10,357	12,230	13,412	13,458	15,701	17,656	21,513	20,344	24,177
BC	**22,681**	**23,412**	**24,671**	**29,144**	**28,146**	**25,945**	**29,517**	**28,146**	**29,651**	**24,146**	**26,217**

Source: Citizenship and Immigration Canada

REFERENCE TABLE 4. UNEMPLOYMENT RATE FOR ALL OCCUPATIONS (%)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
CANADA	7.7	7.6	7.2	6.8	6.3	6.0	6.1	8.3	8.0	7.4	7.2
NL	16.5	16.4	15.6	15.1	14.7	13.5	13.2	15.5	14.4	12.7	12.5
PE	12.0	11.1	11.2	10.8	11.1	10.3	10.8	12.1	11.2	11.3	11.3
NS	9.6	9.1	8.8	8.4	7.9	8.0	7.7	9.2	9.3	8.8	9.0
NB	10.1	10.2	9.7	9.6	8.7	7.5	8.5	8.8	9.3	9.5	10.2
QC	8.7	9.2	8.5	8.3	8.1	7.2	7.2	8.5	8.0	7.8	7.8
ON	7.2	6.9	6.8	6.6	6.3	6.4	6.5	9.0	8.7	7.8	7.8
MB	5.1	5.0	5.3	4.8	4.3	4.4	4.2	5.2	5.4	5.4	5.3
SK	5.7	5.6	5.3	5.1	4.7	4.2	4.1	4.8	5.2	5.0	4.7
AB	5.3	5.1	4.7	4.0	3.4	3.5	3.6	6.6	6.5	5.5	4.6
BC	**8.5**	**8.0**	**7.2**	**5.8**	**4.8**	**4.3**	**4.6**	**7.7**	**7.6**	**7.5**	**6.7**

Source: Statistics Canada

REFERENCE TABLE 5. GROSS DOMESTIC PRODUCT ($ MILLION)*

	2007	2008	2009	2010	2011
CANADA	1,566,015	1,645,875	1,564,790	1,664,762	1,762,432
NL	29,735	31,447	24,989	28,621	33,624
PE	4,621	4,764	4,909	5,161	5,353
NS	33,852	35,394	34,921	36,350	37,015
NB	27,966	28,533	29,026	30,941	32,180
QC	306,317	314,135	316,276	330,400	345,842
ON	597,912	604,164	593,916	625,045	654,561
MB	49,263	51,899	50,828	53,266	55,894
SK	51,964	67,590	60,938	66,036	74,738
AB	258,850	294,716	244,827	271,012	295,276
BC	**196,996**	**203,820**	**195,670**	**208,295**	**217,749**

* 2011 is the latest year for which information is available. GDP data have been revised, but only back to 2007. Consistent data prior to 2007 are not yet available.
Source: Statistics Canada

REFERENCE TABLE 6. GROSS DOMESTIC PRODUCT ($2002 MILLION, CHAINED)*

	2007	2008	2009	2010	2011
CANADA	1,566,015	1,583,164	1,538,834	1,587,558	1,628,295
NL	29,736	29,425	26,388	28,058	28,912
PE	4,622	4,665	4,677	4,800	4,876
NS	33,853	34,685	34,581	35,243	35,424
NB	27,966	28,226	28,065	28,928	28,922
QC	306,316	310,687	309,043	316,724	322,690
ON	597,907	596,722	575,726	594,319	605,180
MB	49,264	51,241	51,056	52,319	53,170
SK	51,964	54,776	52,567	54,854	57,536
AB	258,850	262,864	251,286	261,457	274,717
BC	**196,997**	**199,228**	**194,334**	**200,550**	**206,180**

* 2011 is the latest year for which information is available. GDP data have been revised, but only back to 2007. Consistent data prior to 2007 are not yet available.
Source: Statistics Canada

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